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Selections.

History and Statistics of the Operation of Transfusion of Blood. By W. B. DRINKARD, M.D., M.R.C.S., Demonstrator of Anatomy, National Medical College; one of the Surgeons to the Children's Hospital. (Read before the Medical Society of the District of Columbia.)

Without pretending to give to the subject the space to which its importance entitles it, the following *resume* only aims at calling attention to a somewhat neglected point of operative surgery, which, for its simplicity of application, the brilliancy of its results, and the comparative oblivion which has enshrouded it of late years, has, perhaps, no parallel in the list of surgical remedies.

As a result of that fitful caprice which seems to sway the medical mind, as all others, some points of doctrine, therapeutic agents or surgical appliances, greeted with applause and with flattering satisfaction on their first appearance, reign for awhile by their right of vogue, and then gradually lapse into disuse, disfavor or forgetfulness, as the varnish of their newness wears away. Others, again, born and reborn, as it were, in difficult travail, acknowledged, legitimized, holding a place conquered by painstaking research and elaborate clinical investigation, seem fated always to stand

among the "novelties," and to bear continually, despite their venerable titles, the odium that has attached itself to the youth of most really useful or striking discoveries. Among the latter must be counted the operation of the "transfusion of blood," a procedure antecedent in its hypothetical genealogy, even to circumcision.

A short review of its historical record will serve to explain its varying fortunes, and may, it is hoped, awaken interest in the further practical prosecution of the subject in its relations to the physiology and pathology of the present day.

A passing allusion to the transfusion of blood, in a verse of Ovid,* has served as a text for the belief that this operation was known, or even practiced in the Augustan era; however founded this idea may be, it is necessary to pass over the medical records of remote antiquity, and to reach an epoch more nearly contemporaneous with our own, to find what has been accepted as the first example of the procedure, practiced as an operation on a human patient. No less illustrious a subject than the Pope Innocent VIII, has been credited with the honor of being the first recipient of foreign blood through surgical intervention. His Holiness was, in April, 1492, dying of what a certain grim humor has called "that terrible disease—extreme old age." A daring Jewish innovator, whose name has, unfortunately, not come down to us with the memory of his deed, proposed to find the Pontiff a "fountain of jouvence" in the blood of three youths, who died martyrs to their own devotion and the practitioner's zeal, and without perceptibly lengthening the patient's existence. This statement we owe to Sismondi,† who draws his authority for it from Reynaldus.‡ An examination of the original passage, however, would seem to show that the quotation is a mistranslation, and the treatment adopted was medical rather than surgical; a chemical compound formed from the blood used having been ingested, and not, properly speaking, transfused. But even though the criticism be just, and while it thus divests the early history of transfusion of its most striking episode, it is certain that the unfortunate issue of this case exercised a repressing influence upon the progress of the idea, and retarded its development many years. In 1615, we find a description of the operation in Libavius,§ but it is not until the middle of the 17th century that the real surgical history of transfusion commences.

It would appear that the new impulse given to physiological and pathological studies, in the return from the old Galenistic doctrines

* Ovid, Metamorph. Lib. VIII, v. 33, 4.

† Sismondi, "Histoire des Republique Italiennes du Moyen Age," Paris, 1815.

‡ Reynaldus, "Annales Ecclesiastici," 1733, quoted by V. Belina.

§ Libavius, "Appendix Necessaria Syntagmatis Arcanorum Chimicorum," 1615.

by the promulgation of Harvey's researches and their results, led to the new and more successful attempts to rehabilitate this operation. In 1664 we find Wren in England, and Major in Germany, proving the possibility of successful transfusion in animals; and in 1666 Denis and Emmerets, in France, were fortunate enough to establish the practicability and utility of the operation in man. The results of Denis's experiments are consigned in a "letter written to M. de Montmor, Counsellor of the King in his Councils, etc., by J. Denis, Doctor in Medicine, Professor of Physiology and Mathematics," 1667. Denis's first trial was made on a youth of seventeen years, suffering from fever, and debilitated by frequent venæsection: three ounces of lamb's blood were injected into his veins, with an entire and almost immediate success. The second essay was one rather of curiosity than necessity; the patient, a stout man, aged forty-five, received an injection of lamb's blood, as in the preceding case, without experiencing any disturbance in the prosecution of his ordinary vocation. Denis repeated these experiments on animals with a like result.

At this point one would have thought the operation established on a firm basis, but veteran doctrines, religious prejudices, and metaphysical sophistications mingled themselves with the discussions that ensued upon the promulgation of Denis's letter, until to appease the storm that raged between the two opposed scientific camps, a decree of the Parliament of Paris,* in 1668, virtually suppressed the operation in France. In 1667, however, Lower and King, in England, had repeated the operation on man, with success.† An account of a German case, also that of Dr. John Daniel, who successfully transfused from three to four ounces of blood into a debilitated man in 1667,‡ if perfectly authentic, would dispute priority with Denis's first case. In 1668 Riva and Manfredi § put the operation into practice in Italy.

Now become one of the properties of surgery, the operation again underwent a vicissitude of scientific favor, and lapsed once more into neglect, remaining a dead letter until our own day. Blundell, in his "Physiological and Pathological Researches," published in 1824, brought transfusion again to the notice of the profession, and once more demonstrated the practicability of its application. It is to this publication, and to the article in his

* The immediate cause of this edict was the crimination (and criminal litigation) following upon a case in which Denis commenced the transfusion, but was prevented from completing it. The patient, a man, died very shortly, under circumstances tending strongly to fix suspicion upon his wife as his poisoner. The evidence exonerated Denis, but the event itself proscribed the operation *pro tempore*.

† "Journal des Savants," 6 Fevrier, 1668.

‡ Sprengel, "Histoire de la Medecine," p. 122.

§ "De Novo et Inandita Medico-Chirurgica Operatione," Rome, 1668.

"Obstetricity,"* that is due the prominence ever since assigned, in text-books, to this operation as a restorative means after puerperal hæmorrhage. And yet, despite the complete, if somewhat tardy acknowledgment of the claims of transfusion thus obtained by Blundell, its progress into public favor and practice was still slow. The accumulated statistics, however, of the quarter of a century following Blundell's publications, enable us to bring together a very respectable number of cases, enough already to give material for a fair criticism of the question in its application, accidents and results.

Of the physiological memoirs on the question, elicited by Blundell's essays, the most prominent and well known, probably, is that of Dieffenbach,† published in Muller's "Archives." The same eminent surgeon added a series of six cases to the operations practiced on the human subject, unfortunately with an unfavorable result in each case, an insuccess that is explained by reference to the conditions of those for whose cure the transfusions were performed. MM. Prevost and Dumas published in 1821, in connection with their researches on the blood-globules, the results of experiments instituted for the purpose of determining the practical value of transfusion, endorsed with a decidedly unfavorable opinion, while Milne Edwards in his inaugural thesis (for the doctorate in medicine) in 1823, gives it a favorable mention. The subject was taken up by Bischoff,‡ in a series of transfusions in which birds and mammals alternately served as source and recipient, one for the other; the great point established by the investigator, and one which forms an epoch in the history of the operation, being the efficacy and even the superiority of defibrinated blood for purposes of transfusion. Dr. Routh,§ of London, published in 1849 an interesting paper on the statistics of transfusion, in which he gives the record of the published cases up to his time—forty-eight in all. The total rate of mortality in this list is 1 in 3; the reduced mortality after elimination of all causes of death that could not reasonably be attributed to the operation itself, or of conditions that rendered its good effects but transitory, is 1 in 8½, an exceedingly low rate, although differing only by a very small fraction from the result reached by Mr. Peet, in a paper of which an abstract is contained in the "Lancet," for 1842, and in which 35 cases are recorded, with a total mortality of 1 in 2.7, and a reduced mortality of 1 in 8.3. Dr. Giovanni Polli, of Milan, repeated the experiments of Bischoff in 1852, and with confirmatory results;‖ rein-

* Reprinted in this city, perhaps the earliest of the very few medical works issued here.

† Dieffenbach, Ueber Transfusion; Muller's Archives, 1810.

‡ Muller's Archives, 1838.

§ Medical Times, August 1, 1849.

‖ Archives de Medicine, Oct., 1852.

forcing them with two cases which indicate, if not the active value, at least the innocuity of the operation.

In 1859, Dr. Martin, of Berlin,* presented a record of 57 cases which he had collated, of which 43 were complete successes, and 7 temporary; counting these latter among the failures, we have a mortality of 1 in 4; counting the partial and complete successes together, we have a mortality of 1 in 8; a result very nearly approaching that obtained from the two tables already noticed.

In 1868, Dr. J. Braxton Hicks,† reported three cases of puerperal hæmorrhage treated by transfusion; the interest of these cases centering principally on the fact that the blood injected was first treated by the addition of phosphate of soda, for the purpose of retarding its coagulation. The same gentleman reports six cases in Guy's Hospital Reports for 1869; two of them treated by the old method, and four by his new method; all of these cases had finally a fatal termination.

Two of the most extensive individual records of the late years, so far as I know, are due to Neudorfer, of Vienna, and Nussbaum, of Munich.‡ The first named of these eminent practitioners has had the courage to publish a series of eight cases, with seven deaths; the result in the eighth case being favorable, in that the patient's life was prolonged sufficiently to justify the transfusion. The second has recorded six operations with but one death. With one exception, these fourteen transfusions were performed for causes other than hæmorrhage; and the seven unfortunate cases of Neudorfer were certainly in the first instance unpromising ones.

The annals of European surgery since 1820 are enriched with several lesser series and a large number of unique cases; all of which will be found in the tabulated record at the end of this article. Before analyzing the statistics thus accumulated, (and passing by the minor literature of the subject, in the shape of inaugural theses, essays, and journal articles,) I may make mention of two monographs, the most complete that have yet appeared, and both of them valuable contributions to surgery; those of Dr. Von Belina,§ of Heidelberg, and of Professor Ore,‖ of Bordeaux, both works of remarkable merit, and together exhaustive of the subject up to their dates of publication.¶

* Ueber Transfusion bei Blutungen Neuentbundener, Berlin, 1859.

† Brit. Med. Journal, August, 1868.

‡ Die Transfusion des Blutes, von Dr. L. V. Belina, Swiontkowski, Heidelberg, 1869.

§ Op. Cit.

‖ "Etudes Historiques et Physiologiques sur la Transfusion du Sang," par le Dr. Ore, etc., Paris, 1868.

¶ Apropos of the two works just cited, the author owes it to himself to state that he was unaware of their existence when this paper was written, and until he commenced to prepare it for publication, otherwise he would certainly not have

During the war the operation was performed once in this city, at the Quartermaster's hospital, with encouraging temporary effect, but final insuccess. I am indebted to my friend, Dr. King, of this city, for knowledge of this case; further inquiry has only verified the fact, without eliciting any details beyond the nature of the injury and the result; the name of the operator, I regret to say, is still unknown to me. To the courtesy of Dr. J. P. S. Houstoun, late President in the Transylvania Hospital, I owe the details of three cases, two performed in Philadelphia by Dr. J. G. Allen, and one by Dr. Hunter in the same city. I can hardly think that all American cases are comprised in this list of four, but these are all that a very patient investigation of published records has discovered.

Let us now rapidly glance at the physiological rationale of transfusion.

The earliest authentic operations on record were, as we have seen, performed not merely for the purpose of supplying to the circulatory system a quantity of blood lost in substance, but also to render new and worthier qualities to a deteriorated fluid, being thus, in reality, based upon a higher order of pathology than that on which some operators have placed themselves, even in our time. But this excellent premise was complicated and clouded by the proposition that the physical qualities of the individual, and perhaps even his moral attributes, might be transmissible along with his blood. Hence the quarrels that arose even among the very adherents of the operation, when Denis, in an age whose abundance in theoretical notions of physiology and mystical doctrines of biology rendered it pugnacious and discussive to the last degree, proposed to demonstrate that he could accomplish the purposes of transfusion in man, and by the blood of other animals. Indeed, up to a very late period, it has been deemed a *sine qua non* for the success of the operation that this interchange of circulatory fluid should take place between individuals of the same or nearly allied species—this doctrine was held even by Blundell. The cases of Denis, however, disprove it: in three of the successful cases reported by Dr. Routh, sheep's and calf's blood was used, when the patient, in Dr. Routh's words, "got well in spite of the remedies employed;" while the experiments of Brown-Sequard* are confirmatory of the fact that identity in the specific origin of the

undertaken what had already been so ably done. But it will probably not impair the value of the results to know that they have been independently corroborated by three investigators in as many different countries. With the acknowledgment (over and beyond his general indebtedness) of 48 cases that were new to him, gathered from their united statistics, his distinguished predecessors will hold the writer guiltless of any plagiarism in this brief outline of the subject which has formed the common area of their researches.

* "Comptes Rendus de l' Academies des Sciences," 1857.

blood is not essential to the success of the operation. *A priori* it would seem preferable to employ a fluid which, in its physico-chemical characters, approaches most nearly the blood of man, and so, doubtless, it is; the blood of the sheep, ram, and ox, which have been the main purveyors in the experiments thus far instituted in this direction, being little dissimilar to that of the human species, though not quite so near to its characters as is that of the dog and the monkey, *i. e.*, if we take as a standard the red corpuscles, (the only character by which the differences can be gauged,) these being very little smaller in the two latter races than in man.

Granted, then, that blood, as nearly as possible similar to that of man, is the only essential, and that its origin, this condition fulfilled, is of secondary importance, how does it act?

According to Dr. Playfair,* "the benefits derivable from it are probably two-fold: 1st, The actual restitution of blood which has been lost; and 2d, The supply of a sufficient quantity of blood to the heart, to stimulate it to contraction, and thus to allow the circulation to be carried on, until fresh blood is formed. *Its stimulant action is probably of far the more importance.*" To these I would add: 3d, The supply of a sufficient amount of blood to the cerebro-spinal axis to awaken its exhaustive motive power; and 4th, The supply of nutritive material to the starved economy—every portion of which, in those conditions where transfusion is decided upon as a last resort, must be in urgent need of restoration, and in which every cell and fibre, every ultimate constituent, is failing in its function by a drain of the reparative material needed to bring it, in elementary constitution, up to that point where nutrition is transformed into heat, motion and vital force. That the supply of oxygen to the tissues is not the sole mode of action of transfused blood is shown by the fact that, while we have conclusive evidence to show that the affinity of the fibrine of blood for oxygen is scarcely less great than that of the red corpuscles themselves, yet the experiments of Bischoff, Polli, Panum, and many others, demonstrate that the transfusion is just as effectual when performed with defibrinated blood; and, moreover, the readiest and safest modes of performing the operation are those in which the venous blood furnished for the transfusion, that has already lost a sensible per centage of its oxygen, is transmitted to the patient without contact of the outer air, *i. e.*, without an opportunity of becoming re-oxygenated. *Mass* has something to do with its action, evidently, for in the cases of cholera submitted to transfusion, it was necessary to inject very much larger quantities than in any other condition, to produce a sensible effect. In one case, as much as thirty ounces were thrown in before the choleraic symptoms were overcome. I need not recall the fact that saline

* "Handbook of Obstetric Operations," London, 1865.

solutions have been injected, in cholera patients, in very much larger bulk than this.

It is then probable, that the action of transfusion as a remedial agent is, instead of two-fold, *three-fold:* 1st, Stimulant to the heart and nerve centres; 2d, Nutritive to the economy at large; 3d, Repletive to the circulatory system.

In conclusion, the practical inquiry remains to be answered—to what conditions has transfusion been remedially applied, and with what success?

1. The cases which seem, during the present century, to have been specially selected for the experimental essays of transfusion, are those of *post partum* hæmorrhage. Of these, (not reckoning those of uncertain nature,) I find a record of 89 cases, of which 56 were successful; I simply give here the gross results without entering into the details.

2. For cases of surgical hæmorrhage, transfusion has been performed 23 times; result, 12 deaths, 1 doubtful, 1 in which the patient died before the operation could fairly be said to have been commenced. In two other surgical cases the result was unfortunate or null.

3. In hæmorrhages, other than surgical, (including the higher grades of anæmia due to hæmorrhage,) 13 cases gave 5 complete successes, 1 incomplete.

4. Of 9 transfusions performed in surgical cases attended with extreme exhaustion, 8 were unsuccessful.

5. In asphyxia of the new born child, 3 cases; 2 failures.

6. In cholera, 4 transfusions were followed by death in each case, but in each case, also, after temporary, and in 1 after marked reaction.

7. Poisoning by carbonic oxide, treated by transfusion in 7 cases, yielded to it in only 2; the theory directing its use in these cases being, the restitution to the blood in the body of the oxygen displaced by the carbonic oxide taken into the circulation.

8. Dieffenbach made a trial of it once in hydrophobia, without success.

9. Leucæmia, Bright's disease, mania, and marasmus from various causes, have each been treated by transfusion, but with somewhat doubtful result. In some of these conditions, as anæmia, chlorosis, leucæmia, the operation is worthy of more extensive trial.

10. Transfusion has also been suggested, by Dr. Markham, as a means to be used in the cattle plague, and possibly the records of veterinary surgery may contain some late cases in which this means has been used with advantage. I have not, however, looked up this branch of the statistics of the subject, its records not being

so generally accessible as those of experimental science on the human subject.

It will be remarked, that transfusion has proven much more successful in the hands of obstetricians, or, rather, in the obstetrical cases, than when used as a surgical or medical agent proper, but it will also be seen that accoucheurs have thus far availed themselves of it much more frequently than either of the other classes of practitioners. And while other suggestions as to the remedial efficacy of transfusion might be added to those here given, and will, doubtless, present themselves as accomplished facts in the future, it is, however, probable that it will always find *post partum* and primary surgical hæmorrhages the most favorable conditions for its application. In so far as those cases are concerned in which the operation has been performed, they speak for themselves, and the result of the array, I think, justifies the belief that transfusion is finally, and with every right, establishing its claim to be considered one of the least doubtful and most valuable resources of our art. And whatever fate the future may have in store for it, thus far its chequered career forms certainly one of the most interesting chapters in medical history.

I append a list of all the cases of transfusion that I have been able to find recorded up to date, under their appropriate heads, and in their order of occurrence. Most in the first table having all been performed for hæmorrhages, occurring in the pregnant woman, before, during or immediately after labor, I have deemed unnecessary any further allusion to the pathological condition of the individual patients, the necessary memoranda of the sex and morbid history being added in the remainder of the cases.

No. 1.—Cases of Transfusion in Hæmorrhages of Pregnancy and Parturition.

No.	Operator.	Result.	Date.
1	Blundell	Death	1820
2	"	"	1820
3	Blundell and Doubleday	Recovery	1825
4	"	"	1825
5	Blundell and Waller	"	1825
6	Brigham	"	1825
7	Doubleday	"	1825
8	"	Death	1826
9	Doubleday and Waller	Recovery	1826
10	Ralph	"	1826
11	Jewell	Death	1826
12	Barton and Brown	Recovery	1827
13	Douglas Fox	"	1827
14	Waller	"	1827
15	Clement	"	1828
16	Howell and Doubleday	"	1828
17	Klett and Schragle	"	1828

No. 1.—Cases of Transfusion in Hæmorrhages of Pregnancy, etc.—continued.

No.	Operator.	Result.	Date.
18	Klett	Recovery	1828
19	Savoy	"	1829
20	Blundell	"	1829
21	Gondin	"	1829
22	Bird	"	1829
23		"	1830
24	Killian	"	1830
25	Ingleby	"	1830
26	Killian	"	1831
27	"	"	1831
28	Internes Hotel Dieu, Paris	Death	1831
29	Crosse	"	1832
30	Banner	Recovery	1833
31	Horling	"	1833
32	Bickersteth	"	1833
33	Schneemann	"	1833
34	Tweedy and Ashwell	Death	1834
35	Collins	"	1834
36	Killian	Recovery	1834
37	Healy and Frazer	"	1835
38	Berg	"	1835
39	B. Oliver	"	1840
40	May	Death	1840
41	Wolf	Recovery	1842
42	"	Death	1842
43	"	"	1842
44	"	"	1842
45	"	"	1842
46	Abele	Recovery	
47	Neumann	Death	1842
48	Ritgen	"	
49	Bayer	"	
50	Berry	Recovery	1844
51	Brown	"	1845
52	Greaves and Waller	"	1848
53	Norman and Ormond	"	1849
54	Nelaton	Death*	1850
55	Malfen	Recovery	1851
56	Marmonnier	"	1851
57	Devay and Desgranges	"	1851
58	Monmontier	"	1851
59	Schneemann	"	1852
60	"	"	1852
61	"	Death	1852
62	"	"	1852
63	Turner and Wells	"	1852
64	Higginson	Recovery	1856
65	"	Death	1856
66	"	"	1856
67	"	"	1856
68	"	"	1856
69	Simpson	Recovery	1856

* Patient lived three weeks after the operation, dying at last of puerperal fever.

No. 1.—*Cases of Transfusion in Hæmorrhages of Pregnancy, etc.—continued.*

No.	Operator.	Result.	Date.
70	Wheatcroft	Recovery	1857
71	"	"	1857
72	Martin	"	1857
73	Dutems	"	1858
74	Martin	"	1861
75	Hicks	Death	
76	"	"	1862
77	Weickert	Recovery	1862
78	Hicks	Death	1863
79	"	"	
80	"	"	
81	"	"	
82	"	"	
83	Greenhalgh	Recovery	1863
84	Thorne	"	1863
85	S. Thomas	"	1865
86	Mosler	"	1866
87	Knauff	Death	1867
88	V. Belina	"	1868
89	Hunter	Recovery	1870

No. 2.—*Cases of Transfusion in Traumatic Hæmorrhages.*

No.	Operator.	Cause of Hæmorrhage.	Sex.	Result.	Date
90	Blundell	Rupture of artery	M	Death	
91	Danyon	Complicated fracture	M	"	1829
92	Philpot	Varix in pregnancy	F	Recovery	
93	Roux	Gunshot wound, subclavian	M	Death	1830
94	Scott	Hæmorrhage after removal of tumor	M	"	1833
95	Walton	Hæmorrhage after circumcision	M	Recovery	
96		Complicated fracture, amputation		Death	
97	Turner	Hæmorrhage after amputation	F	Recovery	1835
98	Lane	" operation for strabismus	M	"	1840
99	Blasius	Wound of thigh	M	"	1842
100	Simon	Wound of crural artery	M	Death	1851
101	Sacristan	Rupture of varix	F	Recovery	1851
102	Maisonneuve	Hæmorrhage after removal of tumor	M	Death	1854
103	Neudorfer	" from epithelioma	M	"	1860
104	Esmarch	Exarticulation femur	M	"	1860
105	"	Hæmorrhage after amputation	M	"	1860
106	Michoux	" after removal of polypus	M	Recovery	1860
107	Higginson	" " amputation	M	"	1860
108	Braun	Recurrent hæmorrhage, from polypus	M	Doubtful	1863
109		Complicated fracture	M	Death*	
110	Gentilhomme	Hæmorrhage from uterine tumors	F	Recovery	1866
111	Allen	Compound fracture	M	Death	1869
112		Compound fracture	M	Recovery †	1870

* Case performed in Washington City.

† By a Prussian surgeon, during the late war.

No. 3.—Cases of Transfusion in Miscellaneous Practice.

No.	Operator.	Condition.	Sex.	Result.	Date
113	Denys	Anæmia	M	Recovery	1665
114	"	Diarrhœa and vomiting	M	Death	1665
115	Daniel	Debility	M		1667
116	Lower and King		M	Recovery	1667
117	Blundell and Cline	Scirrhus of pylorus	M	Death	1819
118	"	Puerperal fever	F	"	
119	Dieffenbach	Hydrophobia	M	"	1830
120	"	Asphyxia after Cæsarean sec.		"	1830
121	"	Melancholia		Unfav'able	
122	"	Erotomania	F	"	
123	"	Cholera	M	Death	1831
124	"	"	M	"	1831
125		"	M	"	1831
126	Bougard	Anæmia	M	"	1831
127	Blasius	Asphyxia after Cæsarean sec.		"	1832
128	Josenhanns	Scurvy	M	"	1832
129	Walton and Routh	Cholera		"	
130	Stokes	Collapse in typhoid	M	"	
131	Bliedung	Pulmonary hæmorrhage	M	Doubtful	1839
132	Pritchard and Clarke	Exhaustive vomiting		Recovery	1843
133	Uyteroheven	Hæmorrhage diathesis	M	Death	1848
134	Chassaignac & Monneret	Anæmia	M	Death	1851
135	Polli	Epilepsy	M	Doubtful*	1851
136	"	Chlorosis	M	Recovery	1851
137	Fenger	Anæmia	M	Death	1853
138	Touvenet	"	M	"	1853
139	Lever and Bryant	Hæmorrhage diathesis	M	"	1854
140	Higginson	Exhaustion from lactation	F	Recovery	1854
141	Larsen	Pyæmia	M	Death	
142	Neudorfer	Exhaustive suppuration	M	"	1860
143	"	" "	M	"	1860
144	"	" "	M	"	1860
145	"	" "	M	"	1860
146	"	" "	M	"	1860
147	Nussbaum	" "	M	Recovery	1860
148	"	Chlorosis	F	"	1860
149	Blasius	Leucæmia	M	Death	1861
150	Neudorfer	Pulmonary tuberculosis	M	"	1861
151	Nussbaum	Exhaustive suppuration	M	"	1862
152	"	Extreme debility	M	Recovery	1863
153	"	Epilepsy	M	"	1864
154	"	Anæmia	M	"	1864
155		Carb. oxide poisoning	M	Death†	1864
156	Mollier and Wagner	" "	M	"	1864
157	Sommerbrodt	" "	M	"	1864
158	Mosler	" "	M	"	1865
159	"	" "	M	"	1865
160	Martin and Badt	" "	M	Recovery	1866
161	Mosler	Leucæmia	M	Favorable	1866
162	Demme	Exhaustion after diphtheria	M	Death	1867
163	Bennecke	Asphyxia in neonatus		Favorable	1867
164	Neudorfer	Tuberculosis	M	"	1867
165	Lange and V. Belina	Albuminuric eclampsia	M	Recovery	1868
166	V. Belina	Asphyxia in neonatus		Death	1868
167	Heine and Knauff	Bright's disease	M	"	1868
168	Mader	Scorbutic anæmia		Recovery	1868
169	Allen	Hæmorrhage diathesis	M	Death	1869
170	Hunter	Carb. oxide poisoning	M	Recovery	1870

* This case and date are both doubtful.

† In a Berlin hospital; operator's name unknown.

—Richmond and Louisville Med. Jour.

The Physiological Action of Beef-Essence and the Potash Salts.

Under the above title Gustave Bunge publishes an elaborate paper, the more important points of which are contained in the following translation:

Beef-essence and beef-extract are among the most used agents of modern therapeutics, and for a long time were supposed to contain the substance of the meat. When under rigid experimentation this was discovered not to be the case, and it was found that beef-extract contained little or none of the nutritive portion of the meat, Liebig asserted that the muscular extractives, especially the kreatin and the kreatinin, were of value as a working material for the muscles of the economy. This assertion was shown to be incorrect by the experiments of Meissner and of Voit, who proved that the kreatin and kreatinin were excreted unchanged from the kidneys.

Kemmerich then, in an elaborate paper in the *Deutsche Klinik*, investigated the matter, and arrived at the conclusion that beef-extract is a stimulant, strengthening the heart's force and acting generally more like tea or coffee than like a food.

Kemmerich had noticed that after an injection of concentrated flesh-broth into the stomach of a rabbit there followed increase of the rapidity of the heart's action, and finally death from the paralysis of the heart. He ascribed these results to the influence of the potash salt upon the heart, as he found the same results follow the similar use of the ashes of the meat, in proportional quantity. The quickening of the pulse by a potash salt is, however, in direct contradiction to the experiments of Traube, Guttmann, and Podkopaews, and it was especially to this point that the researches of G. Bunge were directed. He found by chemical analysis that Liebig's extract contains, besides water, 21.9 per cent. of inorganic matter, about half of which is potassa, and of the remainder about 2-20 is soda and 7-20 phosphoric acid.

The first set of experiments were directed to seeing if the extract had any appreciable effect in quickening the pulse of the dog, or in elevating the temperature in the rectum. The chief difficulty in this is found in the repugnance both of the dog and his stomach to the material; but by making it into pills it was finally given and retained for two hours before vomiting came on. The result of the carefully conducted experiments was entirely negative; the largest doses that could be given failed entirely to elevate the temperature or pulse.

These experiments were followed by similar ones made upon himself; every precaution was taken to avoid all disturbing influences, and the result confirmed entirely the previous ones. Owing probably to the perfect quietude preserved, the pulse actually fell in some of the experiments. No increase of the bodily tempera-

ture or the pulse rapidity could at any time be discovered following the ingestion of the extract.

The experiments of Kemmerich on rabbits were then carefully repeated, and similar results obtained. Always following the injection of the beef-extract into their stomachs, there was very marked increase of the pulse rapidity, and finally, if the quantity were sufficient, gradual death from paralysis of the heart. The agreement with Kemmerich's results was complete, even as to the quantity necessary to produce death.

The potash exists as a phosphate in the flesh-extract, and Herr Bunge now injected an amount of the pure salt, equal to that contained in the fatal dose of extract, into the stomach of a rabbit, with the same results as Kemmerich, namely, great increase in the rapidity of the heart-beat, and then death from paralysis of the heart.

The resulting paralysis is in complete accordance with the results of all investigations of the action of the potash salts, and is, no doubt, a direct action of the potash of the extract; as to the increase in the heart's rapidity, that is another question. By direct experiment our investigator found the mere gagging and introducing of the stomach-tube was sufficient to influence for a considerable time the heart's action; but that after this, injection of distilled water, of solutions of sugar, soda, and potash salts, and of beef-extract, all caused very marked increase in the rapidity of the heart's beat. In the case of the warm water this increase was not nearly so lasting as when the saline and saccharine solutions were used. The syrup was especially active in this respect, and the author thinks the increased activity of the heart is simply owing to the effect of the liquid on the intestinal canal and stomach, and that the differences in the endosmotic action of the various fluids is indirectly the cause of the different degrees of their action. All the evidence seems to bear out his conclusion, that there is no proof that the increased rapidity of the pulse, after the injection into the stomach of a rabbit, of a solution of beef-extract or a potash salt, is due to a direct action of the latter on the heart.

Mr. Bunge also studied the action of the potash salt upon the rabbit when injected subcutaneously. He found that after the injection of a fatal dose of a potash solution, there was, after a period of increased rapidity, lessening both of the rapidity and force of the heart's contractions, and finally death. When a not fatal dose was used, there was a decided increase in the rapidity of the pulse. Our author attributes this increase to the pain caused by the injection, but did not prove it, not being able to devise an experiment which should avoid the local action of the salt. The pain produced was very intense, and may have been the cause of the increase of the heart's action, as is made more

especially probable by the fact not noticed in Mr. Bunge's remarks, but evident in his notes on the experiments, that when the potash was injected into the jugular vein no increase in the rapidity of the pulse occurred.

Experiments upon dogs and cats yielded similar results; the slowing of the pulse was only seen in fatal cases, when death took place through gradual extinction of the heart's action.

Various experiments were also gone through to test the effect upon the arterial pressure. In some a slight increase, in others a slight decrease, of the arterial pressure was produced by the injection of the salt into the jugular vein; only after fatal doses was there a decided reduction of the force of the heart. In one case immediate arrest of the heart's action followed the injection.

The nitrate of potash, given to men in doses as high as two and a half drachms, produced no perceptible influence on the pulse or temperature, and heart poisoning from the salt taken into the stomach is shown to be impossible, the quantity required being so great that it would of necessity be rejected.

In conclusion, Mr. Bunge thinks it cannot be longer denied that the beef-tea or beef-essence is really of no use except on account of its taste, which it may impart to a mass of otherwise insipid vegetable food. The feeling of refreshment following beef-tea, he thinks, is only due to its being taken hot, and to its taste having a psychical influence.—*Pfluger's Archives fur die gesammte Physiologie*, 1871, *p.* 238.—*Wood's New Remedies.*

Disinfection.

A disinfectant is, in the broadest acceptation of the term, anything which counteracts infectious, contagious or effete matter. How a few disinfectants produce their effects is perfectly understood, and presents no kind of mystery; how other disinfectants work is matter of dispute, and regarding the action of a good number of them we have as yet hardly arrived at the stage of controversy.

The material whose effects are to be opposed by disinfectants is held by some authorities to be animal or vegetable germs, and by others to be subtle organic poisons of surpassing power; and possibly enough may be of all these kinds, but must at any rate consist of complex organic matter. In common with all organic matter, the matter of contagion may be destroyed, and therefore rendered inoperative, by exposure to a red heat, in presence of excess of oxygen. Fire, therefore, is a disinfectant whose action is intelligible, and whose absolute efficacy is undoubted.

The action of destructive chemical agents, such as hot concentrated sulphuric, nitric or chromic acid, is, in like manner, quite intelligible. Disinfection by this means is even more costly than by fire.

We have instanced disinfectants which are effective and impracticable, in order to throw light on those which are practicable and not effective or much in vogue at the present time. Chlorine, which in the form of bleaching-powder is much employed as a popular disinfectant, will necessarily destroy contagious matter, as it does all organic matter, if suitable precautions be taken to insure the conditions under which it can act thoroughly. But to use chlorine under these conditions is no more practicable than to use boiling concentrated nitric acid, and the manner in which chlorine is actually used, and that which alone is practicable, is not effective.

Suppose, instead of burning the clothes of the plague-stricken patient, we were to reduce them to pulp, bleach the pulp, and make paper of it, should we get plague-paper from the plague-rags? We cannot guarantee that we should not; but if we pushed the action of the chlorine further, destroying the pulp so that it could not make paper, and until complete chemical disintegration, then we could guarantee that it would not be infectious. If, then, there be doubt whether the paper made from some descriptions of infected rags be infectious, what shall we say of the chances of the decomposition of infectious matter by the popular expedient of just sprinkling clothes with a little bleaching liquor? Fumigations of sick-rooms with chlorine gas are not likely to be effective, for long before the proportion of chlorine in the atmosphere could reach the point at which we could hope for any attack of infectious matter existing in the atmosphere (and certainly very long before we could guarantee any attack of the infectious matter), the smell of chlorine would have become unendurable. In fine, the actual practical employment of chlorine as a disinfectant does not rest on a sound chemical basis, and we are not warranted in assuming that any great good is done by it.

Leaving disinfectants which aim at the chemical disintegration of infectious matter, we pass on to others, the *modus operandi* of which is in dispute. Corrosive sublimate, carbolic acid, and sulphurous acid,—do they poison the germs, or are they chemically incompatible in relation to the organic poisons? We shall not discuss this question on the present occasion, but it is a fact, ascertained by experience, that these substances, in common with very many others, have some power of suspending the action of infectious matters. Of late years it has been the fashion to single out carbolic acid as pre-eminently serviceable. But Dr. Sansom, who is one of the warmest advocates of the use of carbolic acid, has shown that if we measure its activity by its power of arresting

fermentation it is far behind corrosive sublimate; and if by its destructive action on low forms of animal life—on spermatozoa, infusoria, and entomostraca—it comes behind corrosive sublimate and most of the commonest acids. In short, there is no reason why carbolic acid should be so singled out, whilst its being notoriously poisonous makes it no fitter for general and popular use than corrosive sublimate.

It appears to us that, whilst possibly all may have their uses in skilled hands, for household and popular use we must avoid corrosive chemicals, poisonous substances, and bad-smelling things, and select agents which, having none of these properties, can be employed thoroughly and unsparingly. The property of deodorizing is also one which will be valued in a popular disinfectant, and since most of the common bad smells are stinking alkaloids, a great variety of substances, including all the acids, will possess this property.

In practicing disinfection it has been sought either directly to influence the state of the atmosphere surrounding us, or else to operate upon the solids and liquids with which we come into relation more or less closely in the course of daily life; and if we would have definite ideas on the subject, the distinction between these two methods of operation must be kept clearly in view.

The *direct* disinfection of the general atmosphere of a town is a task too hopeless to be undertaken by man; as will be manifest from the mere consideration of the vastness of the mass of air to be dealt with, and the comparative minuteness of the materials wherewith to deal with it. Not by one-tenth per cent. can all the breathing of all the inhabitants of a town, and the burning of all the fires in it, alter either the percentage of carbonic acid or of oxygen in the general atmosphere pervading the town. If, then, our means of influencing the atmosphere are so limited that we cannot add to it so much as the one-tenth per cent. of any material, what chance should we have—even if we were to expend the entire national revenue on the undertaking—of so thoroughly dealing with the mass of the atmosphere pervading a town as to eliminate any impurity?

In the days of the cattle-plague, those who were set in authority over us made an assault of this description on the atmosphere of the country. They swept the air of the fields with towels dipped in carbolic acid, and borne aloft on the horns of the cattle, hoping thereby to rid the air of cattle-plague germs. As well might they have tried to alter the composition of the water of the Irish Sea. The first step in practical disinfection is the comprehension of the fact that, whether it be poisons or germs we fear in the out-door atmosphere, we cannot remove them from it by the

employment of anything either to decompose them or to kill them.

Leaving the streets and entering the houses, one thing at least is possible, and that is, to ventilate and secure that the air within the house is not much worse than the air outside. Obviously, too, the limited air of a room lies within the compass of the action of such quantities of chemicals as we are able to command. But whether it is economical to attempt the purification of the air of a room by acting upon it by chemicals, or whether the means which are in vogue are effectual, are other questions. The last we will now take up.

We have before us a little card bearing on it the inscription, "Disinfectants, and how to use them," by Edward T. Wilson, M.B., F.R.C.P.; and among other directions are the following:

"*For an Unoccupied Room.*—Pour two wineglassfuls of dilute sulphuric acid (oil of vitriol) over two ounces of chloride of lime in an earthenware saucer, placed high near the window. It bleaches, and is apt to make white-limed walls sweat. Useful for cabs.

"*For an Occupied Room.*—Put a crystal or two of chlorate of potash into a saucer of muriatic acid (spirit of salt) placed high, as the gas is heavier than air."

We presume that the rooms are of ordinary dimensions—say fourteen feet square and ten feet high—and for convenience of calculation let us take the contents of a room four metres square and three metres high. This gives forty-eight cubic metres, or forty-eight thousand litres' capacity. Now, from the two ounces of bleaching powder we should do well if we get five litres of chlorine gas. We have, therefore, five volumes of chlorine in forty-eight thousand volumes of air, or about one volume of chlorine in ten thousand volumes of air; or, in percentage, 0.01. This is for the *unoccupied* room, but for the *occupied* room the proportion of chlorine (from the crystal or two) would be very small indeed.* Chlorine so highly diluted is not the energetic reagent that it is when pure. If there were traces of sulphuretted hydrogen in

* Some notion of the quantity of chemical substance requisite to effect a real disinfection of the atmosphere of a dwelling-room of ordinary dimensions may be gathered from a recent Oxford Disinfection Minute, which prescribes four ounces of sulphur to be burned in every 100 cubic feet of air. Sulphur yields twice its weight of sulphurous acid, so that there would be about eighty litres of sulphurous acid gas to 3,000 litres of air, equal to 2.6 vols. of gas in 100 vols. of air. ‡ The Minute informs us that "no disinfection of this kind is thorough if a man can live in the room whilst it is going on," from which we see that it cannot be resorted to for the sake of the atmosphere in the room (which must be sent up the chimney or out of the window, and replaced by fresh air before the room becomes habitable), but for the sake of the walls and ceiling, and clothes hung up on poles, etc. In short, it is a method of treating the solids.

the atmosphere of the room, they would coexist for a long time with so weak a gaseous mixture of chlorine, and germs would probably be untouched by it. In short, such a chlorinous atmosphere, though dreadfully disagreeable to human inhabitants, might be organically impure.

The card from which we have quoted falls foul of scents. "Scents are useless," says the card, after having recommended how we may make the sick-room stinking under pretext of purifying its atmosphere. Wiser far were it to make it fragrant with perfumes, which, if they neither decomposed the organic poison nor killed the germs, would delight and not distress the patient.

In fine, if the atmosphere of a room be foul, let it out, which is the cheapest and well-nigh the only practicable, if not the only possible, method of improving it. The proper sphere of disinfectants is the solids and liquids which harm us, either by direct contact with our bodies or by their proximity to us and action on us through the atmosphere.

When we add to the atmosphere of a room a sufficient proportion of an ordinary gaseous disinfectant to act on the atmospheric impurities, we render it unfit to breathe, and fit only to be sent up the chimney. All those mixtures for generating chlorine in dishes exposed in the sick-room, all the cloths soaked in liquid disinfectants and hung up in the room, are more or less futile for the purpose for which they are intended. In this general condemnation we do not include the use of disinfectant cloths to block up window or doorway communicating between the sick-chamber and the rest of the house. This we regard as quite legitimate, and as helping to isolate the patient.

In the selection of disinfectants for use in the sick-room, we should prefer such as are non-volatile and destitute of smell,—such, in fact, as will not themselves defile the air. For this reason, among others, bleaching-powder and carbolic acid are not so suitable as some other disinfectants. Copperas and chloralum, possessing the requisite qualifications of being non-volatile and odorless, and being at the same time active disinfectants, are mentioned in the *Oxford Disinfection Minute*, which we have already referred to, and from which we quote the following:

"Water-closets, privies, cesspools and drains can be disinfected by copperas (sulphate of iron). Carbolic acid can be used with advantage with, or after, but not without copperas. A certain quantity of disinfectant will disinfect only a certain quantity of foul matter; and disinfection is imperfect till all hot smell or alkaline reaction is abolished. For the disinfection of a cubic foot of filth, half a pound of copperas dissolved in a couple of quarts of soft water is sufficient. The daily addition, by each individual using a privy or water-closet, of two-thirds of an ounce of solid copperas to such privy, or one-third of a pint of the above solu-

tion to such water-closet, will keep it wholesome, if any accumulation of filth which it may contain or communicate with has been previously disinfected according to the directions given above. Carbolic acid, which need not be chemically pure, can be used after the addition of copperas till the place smells strongly of it. It should be used in the fluid state, its combinations with lime and magnesia having an alkaline reaction, and being therefore unsuitable for the present purpose. It may be diluted by being shaken up with twenty times its volume of water, and if poured from a watering-pot with a rose-nozzle over the sides of a recently emptied privy or cesspool will do great good. Sawdust or sand strongly impregnated with carbolic acid may be used for this purpose. Chloralum (solution of chloride of aluminium of specific gravity 1160) will acidify ordinary sewage, and destroy its living organisms, when added in the proportion of one part to forty. It may be expected, therefore, to act as a disinfectant. This cannot be said of chloride of lime. All water-closets and privies should, when epidemics of cholera or typhoid may be expected, be disinfected, whether they be offensive or not. It is well at such periods to avoid using any such conveniences which have not been disinfected, especially if, as at hotels and railway stations, they may have been used by persons from infected localities. All the conveniences mentioned need ventilating as much as living-rooms do."

The subordinate position of carbolic acid is noteworthy. If the experiments and researches that have been undertaken in regard to carbolic acid be reliable (*vide* Crace Calvert, in the *Chemical News* of Dec. 9th, 1870, and Dr. Ballard's remarks thereon in the same journal of January 20th, 1871), then we must admit that undoubtedly carbolic and cresylic acids are about the most powerful of antiseptics; and there are few who will not admit that where carbolic acid can be used, it is the best for direct disinfection. Its odor is *the* objection against it, but still there is a very large number of cases in which the odor of the disinfectant proves no bar to its employment.

The Minute also assigns a low rank as a disinfectant to chloride of lime; and here it will not be out of place to indicate the manner in which different disinfectants act on a mass of organic matter in incipient decomposition, such as fæces, urine, etc.

Copperas, chloralum, and Burnett's solution (chloride of zinc) absorb the most offensive products of decomposition, which appear to be stinking alkaloids, and in so doing deodorize; they may also act as powerful antiseptics,—that is to say, arrest putrefaction, and so prevent the production afresh of products of decomposition; but more evidence is wanted on this point. Carbolic acid does not absorb the products of putrefaction which has already taken place, but it arrests putrefaction and so stops the further production of products of decomposition. Bleaching-

powder and Condy's fluid (alkaline permanganate) appear to oxidize the products of decomposition, but they have little power as antiseptics,—that is to say, they have little power of preventing the organic matter from continuing to putrefy. These latter, therefore, are not so economical as other disinfectants.

For use in cesspools and drains there is at present in the market a very cheap material, known as Cooper's salts, and consisting of a mixture of chlorides. It has considerable deodorizing power. It deserves a trial in privies and urinals, and indeed is known to answer in the latter.

Leaving the water-closets and cesspools, and returning to the sick man's chamber, the first thing demanding attention is the night-stool or bed-pan, which should be charged either with a sufficient quantity of copperas or else chloralum. We think that most persons who have tried the two will be inclined to give the preference to the latter, from its superior cleanliness, and in the form of a dry powder sufficiently cheap to be used to cover the excreta it will be found very convenient. Charcoal or sand to cover up excrement and discharges of all kinds, and these moistened with copperas solution or solution of chloralum, will also answer. But carbolic acid and bleaching-powder may be used in the sick-chamber, on an emergency, when nothing better is at hand. Chloralum is very likely the best of the non-volatile disinfectants, but its superiority to Burnett's fluid, sulphate of iron, etc., can hardly be said to be as yet established.

The clothes worn by a patient ill with small-pox or cholera should afterwards be burnt, and, as far as possible, the bedding too. Failing this, they should be boiled for half an hour with soap and water, or else exposed to a dry heat of 250° F. In order to produce an appearance of cleanliness, bleaching-powder may be used in the subsequent washing of the linen of patients suffering from infectious diseases; but it would be injudicious to rely on that substance as a disinfectant of the linen. Finally, it should be remembered that the surface of every solid which is for a length of time exposed in a sick-room inhabited by patients suffering from infectious diseases is liable to contract a taint, and will need disinfection. The surface of the patient may even be treated, and with great advantage to himself and everybody concerned. In most cases, as is now recognized, a bath will at least do no harm, and in cases of small-pox the addition of some convenient disinfectant to the bath has been found to comfort the patient.—*London Lancet.*

The Treatment of Fever.

On this broad subject Dr. Charles Murchison lays down the following principles in *The British Medical Journal:*

1. To remove, when possible, the cause on which the fever depends.
2. To promote elimination, not merely of any morbid poison, but of the products of exaggerated metamorphosis in the blood and tissues.
3. To reduce the temperature and the frequency of the action of the heart.
4. To maintain the nutrition of the tissues and stimulate the action of the heart by appropriate food and stimulants, taking care, at the same time, not to excite congestion or increase the work of the already overtasked glandular organs.
5. To relieve dangerous and distressing symptoms.
6. To obviate and counteract secondary complications.

1. Unfortunately, it is not often that we have it in our power to remove the cause of pyrexia; but the object is one always to be kept in view, and sometimes the main efforts of our treatment must be directed to secure it; as, for example, pyrexia depends upon pent-up pus, an obstructed bowel, or gouty, syphilitic or periosteal inflammation.

2. The elimination of any morbid poison, as well as of the products of exaggerated metamorphosis, will often be promoted by the judicious employment of diaphoretics, diuretics, purgatives, and emetics. The old practice of commencing the treatment of pyrexia by giving a purgative to unload the portal circulation and promote the action of the liver, is undoubtedly a good one, and is particularly advisable in persons of robust habit, or who live too well. In mild cases of pyrexia, the only treatment necessary consists in the avoidance of any chill, and in the administration of a mild aperient, followed by frequent doses of diuretics and diaphoretics, such as the citrate of potash, or the liquor ammoniæ acetatis with spirit of nitrous ether. Elimination will also be promoted by a plentiful supply of fresh air, which will favor the escape of carbonic acid from the lungs, and by the free use of diluents, which will help to wash away through the kidneys the products of tissue-waste. In all grave cases of fever you will remember the importance of maintaining the action of the kidneys, and of keeping a good watch on the state of the urine; noting carefully not so much its color and the presence or absence of lithates (both of which characters will depend much on the quantity), but the quantity and the presence or absence of albumen.

When the quantity becomes notably diminished, or albumen appears, advantage will often be derived from hot poultices to the loins, aperients, diaphoretics, diluents, and diuretics. But while you promote elimination, you must take care that the means for this end do not weaken too much the action of the heart; and you must remember that, in some fevers, the natural processes of elimination are excessive, and conduce to dangerous exhaustion and death.

3. For reducing the intensity of the pyrexia, different measures have been proposed.

Blood-letting was at one time universally resorted to for this object, but in this country it is now entirely discarded, because it was found to increase one of the great dangers in pyrexia, viz., failure of the heart's action. There are few accurate observations on the effects of blood-letting on the temperature of pyrexia; but we know that, when a copious bleeding of the nose or the bowel takes place in enteric fever, although the temperature may fall below the normal standard, it speedily regains its former height or rises above it.

The external use of cold water is one of the most certain means of reducing temperature in pyrexia, and in certain cases is attended with good results. The attention which this practice is now attracting will justify the following remarks:

In the seventeenth century the brothers Hahn, of Leipzig, treated fevers by the external use of cold water, but their observations were soon forgotten. Toward the end of last century (1787) cold affusion was proposed by Dr. Currie of Liverpool, both for arresting and mitigating fever. The patient was seated naked in an empty tub or bath, and several buckets of water, of a temperature of 50 or 60 deg. Fahrenheit, were poured from a height of from two to three feet, or more, over the head and chest. He was then hastily dried, and restored to bed, and, in most cases, the operation was repeated once or twice daily. It was stated that, in many cases, if resorted to during the first three days, this treatment arrested the disease; while, in others, it reduced the pulse and temperature, relieved many of the distressing symptoms, and particularly the headache, restlessness and delirium, and conducted the disease to a safe and speedier issue. The affusions were employed at any stage of the fever; but the effects were always most salutary at an early stage. They were said to be contraindicated when the temperature of the skin, ascertained by the thermometer, was not much above the normal standard, or when, notwithstanding an elevation of temperature, the patient complained of chilliness, or suffered from severe diarrhœa or profuse sweating.

The wonderful results obtained by Currie were confirmed by numerous observers in differents parts of the world, whose testi-

mony is recorded in the edition of his work published in 1804.* But in the British epidemic fever of 1817–19, the practice was followed by many with great perseverance, and the general result, according to Sir Robert Christison, was, that in very few cases, if any, was the disease arrested by it; that although an abatement of febrile heat and restlessness occurred almost invariably, it was of short duration, and not to be made permanent by any frequency of repetition; that as much good eventually was attained by frequent cold or tepid sponging, together with cold applied to the head; and that often the cold affusion occasioned for a time after each application an intense feeling of pressure and weighty feeling in the brain, which could not be regarded without some uneasiness.† These statements backed by professional and popular prejudice, account perhaps for the subsequent neglect of cold-water treatment of fevers. But the observations made of late years by Brand, of Stettin, Jurgensen, of Leipzig, Liebermeister, of Basle, Ziemssen, of Erlangen, and H. Weber and Wilson, of London, show that, although the practice may not shorten the fever, and is often inapplicable, yet under certain circumstances it is useful not only for reducing the temperature, first of the surface and then of the interior of the body, but for relieving headache and other distressing symptoms, removing congestion of the kidneys, warding off delirium and coma, and rousing the nervous system in cases of excessive stupor. The circumstance has perhaps been too much lost sight of, that cooling the body may not influence the conditions on which the development of heat depends; but with reduced heat it may be assumed that there will be diminished metamorphosis, to the non-elimination of the products of which many of the dangers of fever are due.

In point of fact, Schroeder, of Dorpat, has ascertained that cold baths effect a marked diminution in the excretion of carbonic acid and urea in fever;‡ and as this was not attended by any aggravation of the general symptoms, it is fair to attribute it to a retarded metamorphosis of tissue.

Statistics have been appealed to to prove the great success of the cold water treatment of fevers (particularly of enteric fever) as contrasted with that of an expectant method; and, although other conditions not stated may have helped to influence the result, they suffice to show that the practice is not beset with the dangers commonly imagined. But the most conclusive facts in favor of

* *Medical Reports on the Effects of Water, Cold and Warm, as a Remedy in Fever.* By James Currie, M.D., F.R.S. 1804.

† Article, "Continued Fever," (*Library of Medicine*, vol. i, 1840.)

‡ Ueber die Einwirkung kalter Bader auf die Co—und Harnstoff—ausscheidung beim Typhus.—*Deutsch Archiv. Klin. Med.* 1869. Bd.; vi, s, 385.

the practice are those observed in certain cases of hyperpyrexia by Dr. Wilson Fox* and others, where its employment was followed by recovery from an elevation of a temperature (110 deg. Fahr.) which under every other method of treatment has been speedily followed by death. At the same time there are many cases of pyrexia in which the cold effusion or immersion would be unsuitable or injurious. It is likely to be of the most service when the temperature is under 102 deg. Fahr., or when the extremities are cold, although the temperature of the central parts of the body be high; and it must always be employed with caution when there are the signs of weakened cardiac action or of stagnation of blood in the capillary circulation, although it may be noted that in one of Dr. Fox's patients, who was apparently rescued from death, the face was cyanotic, and the radial pulse imperceptible.

There are different plans for employing cold water in the treatment of pyrexia, such as the cold affusion practiced by Currie, packing in a cold wet sheet resorted to by Brand, or immersion in cold baths. The last is the method now most in fashion. The patient is placed in a bath having from 50 to 70 deg. Fahr., or better, as Ziemssen recommends, in one whose temperature is about 10 deg. below that of the body, but which, after the patient's immersion, is gradually cooled down to 68 deg. by adding cold water. He should remain in the bath for half an hour, or until shivering comes on, and all the time he is in the bath his limbs ought to be rubbed by assistants. He is then to be hastily dried and put into a warm bed. For some time after the bath, the temperature in the rectum continues to fall as the trunk parts with its heat to the extremities; but as soon as the temperature in the rectum rises again to 104 deg., the patient ought to have another bath. In the early stages of the fever, as many as seven or eight baths in the day may be necessary. When cold affusion or immersion is contraindicated or inexpedient, frequent sponging of the surface with cold or tepid water will also help to cool the body, and is often a source of much comfort to the patient.

Quinine in large doses has an undoubted influence in lowering the temperature of pyrexia. In most cases of severe pyrexia, ten, fifteen or twenty grains will, within an hour or two, cause a fall of the temperature to the extent of three or four degrees, and to a less degree of the pulse.† It is true that the effect passes off after a few hours, and that there is no good evidence (except in malarious fevers) of its cutting short the natural course of the attack; but the effect may be maintained by a repetition of the

* *On the Treatment of Hyperpyrexia by Means of the External Application of Cold.* London: 1871.

† For evidence on this point, see Report of a Committee (of which I was a member) of the Clinical Society.—*Trans. Clin. Soc.*, 1870, vol. iii.

dose; and the remedy has often appeared to me to be of signal service when a pyrexia was at its crisis, and when the temperature was rising in place of falling.

Digitalis, aconite and veratrum viride have a marked power in reducing the pulse, and, to a less extent, the temperature in pyrexia, and are, in my opinion, too much neglected for these objects in practice. Veratrum viride is largely used in America in the treatment of fevers, and its effect upon the pulse is speedy and most decided; the only objection to its use in private practice which my experience suggests, is its liability to induce sudden nausea and faintness, but these symptoms are transient, and cease on the administration of a stimulant. Ten or fifteen minims of the tincture may be given every four or six hours. Aconite is a remedy of great value for reducing the pulse and temperature in fever, and especially in the pyrexia resulting from local inflammations, and is much less used than it deserves to be. Digitalis is another remedy which I have often found very serviceable in various forms of pyrexia. While increasing the force of the cardiac contractions, it diminishes the frequency of the pulse, reduces the temperature, and increases the flow of urine. Lastly, *antimony* reduces, in a marked degree, the frequency of the pulse in pyrexia, and promotes diaphoresis and mucous secretion. It was at one time largely used in all fevers, but in many it is contra-indicated by its tendency to weaken the contracting power of the heart.

4. The nutrition of the body must be maintained by appropriate food, in the form of milk, beef-tea, eggs and farinaceous articles. Not long ago it was a custom to starve fevers; and you may probably have heard that the late Dr. Graves, of Dublin, who was mainly instrumental in doing away with this objectionable custom, expressed a wish that his epitaph might be, "He fed fevers." The modern tendency, however, is perhaps to over-feed fevers, and especially to give too much nitrogenous food. Dr. Parkes has shown that there are theoretical objections to a purely nitrogenous diet in fevers. It is doubtful if the disintegrating nitrogenous tissues can be fed; and in that case the albuminous food must be got rid of by the already over-tasked glandular organs. Milk is is in most cases preferable to beef-tea as an article of diet in fevers.

In many cases of fever it will be necessary to give stimulants. You must not give stimulants simply because the patient has fever. Many patients with fever do better without them. But you must not refrain from giving stimulants when the heart shows signs of weakness, as happens in the advanced stages of most protracted fevers. The heart may be artificially stimulated by sinapisms and other irritating applications to the skin, but better by the internal

administration of ammonia, ethers, and alcohol, in quantities proportioned to the weakness of the heart and pulse.

5. In every case of pyrexia, you must combat dangerous symptoms as they arise. Stagnation of blood in the pulmonary capillaries impeding the aeration of the blood, is to be met by stimulants, such as alcohol, carbonate of ammonia, and ethers. Digitalis, by strengthening the heart's action, and turpentine, which seems to stimulate the capillary circulation, are also useful under these circumstances; while advantage will likewise be derived from mustard and linseed-poultices to the chest, and from warm applications to the feet. When uremic symptoms predominate, the action of the skin and bowels is to be promoted, digitalis and saline diuretics may be given to increase the flow of urine, sinapisms and linseed-poultices are to be applied over the loins; while attempts may be made to rouse the patient by cold affusion to the head, by blistering the shaven scalp with liquor ammonia, and by sinapisms to the nape and feet. In many cases of fever you will also be called upon to relieve distressing symptoms—such as diarrhœa, pain, sleeplessness and delirium—which, if unchecked, hasten exhaustion and prevent recovery.

6. You must counteract, as far as possible, secondary complications, which will vary according to the primary cause of the pyrexia, and which always add to the patient's danger.

Lastly I would caution you against two errors in the treatment of pyrexia.

1. You must take care that the remedial measures which you adopt in no way thwart the natural modes of recovery, or favor the natural modes of death.

2. At the same time you must not be content with adopting a treatment of pure expectancy. You must not forget that the natural termination of pyrexia may be death, as well as recovery. —*Philadelphia Med. and Surg. Reporter.*

Case of Extra-Uterine Fœtation. By W. CHARLES PERKINS, M.D.

On May 20, 1871, Mrs. K., æt. 31 years, called to consult me concerning some uterine trouble, from which she had been suffering for the past three years. She stated that up to October, 1868, she had enjoyed fair health, having had two living children, with good deliveries, and did fairly well afterwards; that on the 4th of October, 1868, she with her friends went into the city to witness the great McClellan parade, and that, whilst standing on the sidewalk, some intoxicated men in a wagon attempted to drive over

them. The fright occasioned an abortion, on the 16th of that month, of a fœtus three months old. She further stated that within a week afterwards she was seized with violent pains in the lower part of the abdomen, accompanied by high fever, costive bowels, and difficult micturition; and that she continued to suffer repeated attacks until the last of January, 1869.

Her health then became somewhat better, but she still remained weak and feeble, with no appetite, with costive bowels, and with her menses occurring, from that time until I saw her, irregularly,—at times every two weeks, every three weeks, and sometimes after an interval of two or three months. A dark offensive discharge now setting in, she placed herself in the hands of a professed gynæcologist, who treated her for ulceration of the womb, and "burned off" some ulcers, at intervals of from one to two weeks, for nearly two years.

I found her anæmic, thin, and much reduced by severe pelvic pains, loss of appetite, and general malaise. She had menstruated irregularly every two or three weeks until the present time. A vaginal examination revealed a soft and flabby condition of the cervix, with thin watery discharges like coffee in color, an enlarged and soft uterus, much prolapsed, but no ulceration or inflammation.

On separate occasions I made two of these examinations with like results, but did not venture to use the sound, as she informed me that her doctor had insisted that she was pregnant; and I therefore preferred to await developments. On May 29 her mother brought to my office what she supposed was an aborted ovum, expelled by her daughter. It resembled a mass of solid flesh, of a pale color, and felt in the hand like a small placenta; but on a more minute examination I could detect no semblance of a cord or point of attachment, and thought, therefore, that it was a blighted ovum. Very unfortunately, I let the mother take it away with her. On the 30th of May I was sent for in the middle of the night, and found Mrs. K. suffering from every symptom of peritonitis; but this passed off in about ten days. On June 4 she was again attacked in a similar manner, this time with what appeared like a pelvic hæmatocele, as upon examining the vagina, which was hot and very sensitive, there appeared surrounding the uterus a soft swelling, which gave the most exquisite pain when touched. Her condition at this time was truly critical; the pain was agonizing; she had a high fever, with a weak and feeble pulse of 150, attended by collapse. She, however, revived out of this, but was still very feeble and prostrated, suffering from constant pain, which was kept bearable only by large doses of morphia. Feeling the need of additional advice, on July 6, during another violent attack, I called in Dr. William Goodell, who, after being informed of the supposed abortion in May, proceeded to make as careful an examination as the exquisitely tender vagina and abdomen would permit. He

found the cervix immovable, the os patulous; the roof of the vagina hard, hot, and exquisitely sensitive; the abdomen tympanitic; and the pelvis containing an irregular tumor, projecting very decidedly towards the left iliac region. In view of these symptoms, Dr. G. pronounced the case to be one of perimetritis. Under treatment, the symptoms again subsided, leaving in the left groin a large irregular tumor, which was excessively painful to pressure. Upon an examination *per vaginam*, always unsatisfactory from the extreme tenderness, a tumor could be felt encircling the left side of the uterus as far front as the median line, and back to the Douglas cul-de-sac. On the 14th of July she was subjected to another attack of violent pain and high fever, followed by collapse of all the vital powers. I then called in Dr. D. H. Agnew, who pronounced in favor of pelvic cellulitis. A second tumor now developed itself in the *right* groin, which acted precisely like that of the left. After a long and tedious illness, attended by repeated attacks of violent pain, high fever, and collapse, which seemed, in the order of their coming, to appear at such intervals as corresponded to her former menstrual flows,—that is, as was habitual with her, about every two or three weeks,—she slowly began to mend, the tumors apparently subsiding gradually. On the 20th of August she informed me that another tumor was growing in the median line. I watched its rapid growth with considerable uneasiness, making frequent vaginal examinations, but remained in the conviction that the tumor or tumors were the results of effusion in the broad ligaments, or else that an ovarian tumor was developing itself.

Quite puzzled by these sypmtoms, on August 30 I called in Dr. John S. Parry, who at once placed his ear upon the abdominal tumor, and, to my great surprise and confusion, detected a remarkably loud double-knock of a fœtal heart, and an unusually loud placental bruit. Dr. Parry thereupon pronounced the case to be one of ordinary pregnancy, and thought that all the previous violent attacks had not been inflammatory but hysterical. At that time he found the os uteri in its normal position, and concluded from the development of the womb that the woman was seven months gone. He accounted for the abortion in May by the theory that it was the casting off of the blighted ovum of a twin conception. After this discovery I quietly waited for the labor to take place, which I supposed would be about the middle of November at the farthest. Meantime she still suffered from violent attacks of pain, high fever and great debility. In these attacks I often carefully examined her, but could never find the os uteri, and therefore began to fear that something was wrong. On the 29th of November Mrs. K. accidentally ran violently against the corner of a table, receiving on her right side a very severe blow, after which she felt the movements of the child no more, although before this

accident they had been unusually strong. Nor could I detect the fœtal pulsations, which hitherto had been very distinct. About the middle of December, fully four weeks beyond the expected time of her delivery, her friends began to be clamorous to have me induce labor. This, however, I declined to do; but, finding that her strength and appetite were failing, and that she had bad night-sweats, on January 4, 1872, I again sent for Dr. Goodell. He found no fœtal or placental sounds; but the vagina was now filled up by a large tumor, containing fluid, in which he thought he could feel the body of a fœtus. Squeezing his whole hand in past this obstruction, with much difficulty, he discovered the long-lost os uteri, situated three inches above the superior aspect of the symphysis pubis. He at first deemed the case to be one of retroversion of the gravid womb, the fundus being bound down by adhesions, but at a second visit he decided that it was a case of extra-uterine fœtation, and asked for additional counsel.

Accordingly, on January 15, Drs. Goodell and Parry met me. After placing the patient under ether,—which we did very reluctantly, because she was so weak,—a careful examination detected a large cyst or tumor occupying the pelvis and the Douglas cul-de-sac, soft and fluctuating as if filled with fluid. The os uteri was found high up above the pubes, as before stated, feeling like a puckered hole. The finger could be introduced as far as the second joint, but without touching any ovum. The vaginal portion of the cervix was entirely effaced; but the surrounding tissues, being neither soft, bulging, nor velvety, were utterly unlike those of pregnancy. The fœtus could be detected through the walls of the abdomen, but not through the vagina. It was immovable under taxis, and very different in feeling from one contained in a uterus. In order to confirm the diagnosis—for a question of ovarian cyst had been raised—a long exploring-trocar was pushed into the vaginal tumor, and the fluid collected gave the unmistakable odor of liquor amnii.

It was proposed, in case my patient grew worse, to open the cyst and deliver the child by the vagina; but all operative interference was refused by herself and friends. The next day I was surprised to find her very much better; she was sitting up and talking with her friends most of the time. That night, however, she was full of pain, suffering and restlessness, with a slight dribbling of the liquor amnii from the small puncture. From this time, as on many former occasions, she had constant pain, high fever, and great debility; until, worn out by her sufferings, she finally died on the 21st of January.

Fifteen hours after death the body was opened by Dr. Wm. G. Porter, in the presence of Drs. Harlow, Goodell, Parry, Jenks, and myself.

On exposing the cavity of the abdomen, an immense cyst, rather

on the right side, was at once brought to view. It contained a very large quantity of liquor amnii, and a male fœtus of full development, weighing about eight pounds. As the skin had begun to peel off from most of its body, it had evidently been dead for some weeks. The cyst was moderately adherent to the right abdominal wall, but closely attached to the pelvic and spinal tissues.

An enormous placenta lay near the right kidney, overlapping the spine. It was very closely adherent, and was much thickened by an old extravasation of blood. The bladder was flattened out by the great pressure to which it had been subjected. In front of the cyst and closely attached to it was the uterus, much enlarged; its mucous coat was much thickened and its cervix elongated. Each Fallopian tube was stretched out like a band, encircling the anterior aspect of the cyst; but neither of the ovaries could be discovered.

Remarks.—There is but little doubt in my mind that this was a case of ventral pregnancy, for an ovarian or a tubal pregnancy could hardly have attained to such a development. Also, that the supposed mole expelled on May 29, which led us astray for so long a time, quite putting out of our minds the idea of pregnancy, was the decidual cast of the uterus, invariably formed and often thrown off during an extra-uterine fœtation. She must have been four months gone at that time, and had, therefore, carried the fœtus over twelve months when she died.

It seems quite likely that the extravasation of blood under and into the substance of the placenta was due to the fall upon the corner of the table on November 29, and that this had undoubtedly caused the death of the child.

The attacks of peritonitis, accompanied by so much pain and collapse, may very probably be traced to the irritation produced by this cyst in the peritoneal cavity, and to the stretching and rupture of some of the adhesions as it developed in size. In future, an unusually loud or very distinct placental bruit, or *very* distinct fœtal heart-beats, would lead me to suspect extra-uterine fœtation. So, also, would the condition of apparent retroversion of the gravid womb beyond the fourth month of gestation.

In vol. xii., London Obstetrical Transactions, page 331, Dr. J. Hall Davis describes a case of ventral pregnancy, eight months advanced, almost identical with mine. Here, the os was situated high above the pubes; and, deeming the case to be one of retroversion, that excellent accoucheur first attempted to replace the womb, and then, failing in this, introduced a tent, and also Barnes' dilators, in order to bring on labor. In this case, however, the cyst ruptured before death; but no correct diagnosis was made, and the extra-uterine fœtation was only discovered at the autopsy.

Finally, were I to meet with an analogous case, I should not hesitate to recommend a vaginal incision into the cyst, and the delivery of the child *per vias naturales*, provided the woman's health had begun to suffer as my patient's had. If, however, the woman's health be not seriously impaired, it would be more prudent not to interfere; for there are many cases on record in which a fœtus thus situated has been carried for very many years, without causing any disturbance whatever.

In conclusion, for much light thrown on the clinical history of this rare case I wish here to acknowledge my indebtedness to an extremely interesting discussion at the Obstetrical Society of this city, to which I was courteously invited.—*Medical Times.*

On the Action of Belladonna upon the Heart and Arteries, and upon the Heart in Pericarditis and Endocarditis. By DAVID WOOSTER, M.D.

1. Belladonna is not a hypnotic in any just sense. It does not induce sleep by allaying general nervous irritability, nor by relieving local pain, as a neuralgia, or the pain of a pleurisy, or of a sprain, or of a phlegmon.

2. Belladonna is an excitant in small doses. For example, if five drops of the fluid extract be administered, and two hours later five drops more, in thirty minutes, or less, after the second dose, the pulse will have increased in frequency and tension but diminished in volume. The temperature will have ascended some part of a degree, and sometimes as high as two degrees. The heart will be found to beat with increased emphasis as well as frequency, and if its rhythm was faulty before the doses, this will be found to have improved or become quite regular, the patient will experience a sensation of increased temperature, and perhaps he will find some difficulty in reading a printed page; the letters will appear to "run into each other." This dose will increase the renal excretion, and will not retard peristaltic action of the alimentary canal, but will rather add to this action.

3. Belladonna in small doses doubtless diminishes the caliber of the capillaries and thus relieves peripheral congestion, and perhaps retards or suspends early inflammatory action. Large doses, again, in children, will produce a general scarlatina of the whole body, attended with delirium and great fear, and often with a sense of choking. Under such doses the child will complain of headache and dizziness, the latter doubtless caused by aberration of vision from dilated irides. Small doses will just as surely produce pale-

ness of the extremities in health, and diminished redness of inflamed surfaces in disease. These two effects are paradoxical in appearance rather than in reality. The drug first stimulates the muscular coat of the vessels to contraction, and this excitation being continued, the sensory nerve filaments at length lose their irritability; that is, fail to appreciate the presence of the drug; and so the vessels not only do not continue to contract, but actually dilate, in consequence of exhausted nerve irritability; and when the drug has been continued to this degree, we have congestion first of the venous and next of the arterial capillaries, and lastly of the whole circulating system; and if the drug be still continued, total anæsthesia follows, and then universal paralysis, in which each individual organ participates, and the sum total is death.

4. But if Belladonna is an excitant to the heart and arteries, and it is so admitted to be, and if it has the same effect applied locally as given internally, and this is admitted, then how can it be recommended in pericarditis and endocarditis? Is it not almost certain that the good effects derived from its employment must be attributed to the remedy in combination with which it has been employed,—as spread on blisters applied over the precordia or the joints, given internally with aconite or digitalis, which latter are undoubted cardiac sedatives, and do undoubtedly diminish the frequency and emphasis of the heart-beats, and the force, frequency and volume of the pulse?

It is exceedingly difficult to reconcile the known primary excitant action of belladonna with any antiphlogistic action of the heart affections named above, and the only hope we could have of any beneficial action from it would be in its slight diuretic effect. But this latter would by no means compensate for the nervous restlessness, increased heat, accelerated circulation, vague uneasiness and postponed sleep induced by atropia.

The only conditions of the heart in which atropia would seem to me a probable remedy, would be in fatty metamorphosis or in the cardiac debility attending low fevers. It might also be of service in the exhausted condition of the heart in the last hours of endocarditis, when, to hold out any hope of life, cardiac innervation must be prolonged until the amorphous endocardial exudation shall have been so far reabsorbed as to allow the presence of blood itself to be appreciated by the sensory filaments of the endocardial lining.—*Pacific Med. and Surg. Journal.*

Original Communications.

ARTICLE I. — *The Hypodermic Use of Corrosive Sublimate, in the Treatment of Syphilis.* By CARL PROEGLER, M.D., Naperville, Illinois.

The aim of every kind of antisyphilitic treatment is to eliminate from the system all traces of the venereal poisoning. The treatment that will do this the most thoroughly, the most rapidly and the most agreeably to the patient, and is at the same time the most economic in the outlay of money and strength of the patient, ought to be the one that the physician should employ. The element of time should be largely considered in a country like ours especially, where every man's time is money. And if a treatment, embodying the points above named, can be used without necessitating any withdrawal from one's daily avocation, and requires no modification of diet or previous preparation of the system for receiving the medication, that course of treatment must commend itself at once.

To the sarsaparilla sweat-cure used some years in Germany, to the hunger-cure much in vogue at one time in France, the above meritorious points do not inhere. Besides, it is pretty well conceded by all syphilographers, that the only reliable antisyphilitic remedies are mercury and iodide of potassium. The latter remedy is not reliable for the severer forms of the disease. Relapses assuming the tertiary forms, viz.: periostitis, necrosis, rupia ulcerations, etc., are apt to follow the use of this medicine. It, too, is not potent enough to combat these forms of syphilis in the majority of cases. Even those who strongly incline to the anti-mercurialist's view, acknowledge that as an *ultimum refugium* mercury should be used, and that it does overcome the most unyielding forms of this disease. It is also believed that mercury is as thorough in all forms of syphilis as the most vaunted of treatment, since relapses after its use are as few, or fewer than after any other course of medication.

Since, then, mercury is an acknowledged remedy for syphilis,

and in some cases the only sure one, the question now remains, *How and in what way shall it be used?*—by internal administration, by fumigation, by inunction, by introduction of mercurial suppositories, or by subcutaneous injection ?

Of these five ways, I think the latter is decidedly preferable. Although it is comparatively recent, yet the method has been so thoroughly tested that the physician who gives it a fair trial will greatly prefer it to the other forms of administration.

The internal use of mercury for the cure of syphilis is generally a protracted treatment, whether the drug is exhibited in the form of the iodides, chlorides, or in other forms.

For centuries, this drug has been blamed for producing salivation, stomatitis, dyscracia, and a general cachexia. By the subcutaneous employment of the drug, a much smaller quantity is necessary to be introduced into the system, and consequently the liability to ptyalism, and the bad effects of hydrargyrum are proportionably diminished and almost entirely avoided.

From statistics given by Prof. Lewin, Surgeon-in-Chief of the syphilitic wards of Charity Hospital, Berlin, where upwards of 2,000 patients have been treated by the subcutaneous method with the mercurial sublimate, we see that from 1½ to 3 grs. of the bichloride is all that was needed for the average of cases, including the most obstinate forms of tertiary syphilis.

So far as fumigation is concerned, it has no merits above the internal use for eradicating the disease, and it requires generally more time than most patients can well spare for each mercurial bath. Though strongly recommended by Langston it is very unpleasant to sensitive patients. Often this method is futile to overcome the disease.

The use of mercurial suppositories inserted into the rectum has been strongly recommended by Lebert, but the general verdict as to their efficacy is, that their results are unsatisfactory.

The hypodermic method, consisting of the use of a solution of the corrosive sublimate, was first successfully used and advocated by Prof. Lewin in the Berlin Charity Hospital, and also used by him in his private practice. He has somewhat modified the common hypodermic syringe which is inconvenient to use, and if used, an assistant is very necessary in order that the fold of skin may be held up and thus the fluid be delivered into the loose

cellular tissue. If injected into the firm, unyielding subcutaneous tissue, much pain and even sloughing and abscesses may follow. Tiemann & Co., New York, are now making, by my suggestion, a syringe in accordance with Lewin's modification

The quantity used daily, depends somewhat on the gravity of the case. Ordinarily, doses from 1-12 to 1-4 grain are administered subcutaneously once each day. If the prodromes of salivation occur, a pause of three or four days may take place, when the treatment may be resumed. In urgent cases, sometimes 1-4 grain, twice daily, has been used by Prof. Lewin when the integrity of important organs have been attacked by the disease, *e. g.*, ulceration of the vocal chords or syphilitic iritis. When such large doses, however, are given, the toxic effect of the medicine may show itself to some degree.

Which solution to employ in any particular case, must rest upon the idiosyncrasies of the patient, his condition and the state of activity of the disease, etc. In ordinary cases it might be well to commence with the weaker and then adopt the stronger, if thought best. (I refer here, for particulars, to Prof. Lewin's book on syphilis, and its treatment by subcutaneous injections of sublimate, translated by Dr. Gale and myself, which will appear in a short time at Lindsay & Blakiston's, Philadelphia.)

When a patient exhibits a peculiarly sensitive diathesis, and whenever the sublimate injection is followed with pain, a small quantity of morphine may be added as a corrective. This will diminish the irritation and consequently the inflammation that might follow in highly sensitive persons, for *ubi irritatio, ibi fluxus*. With cases of this class we have added the morphine, or applied externally a chloroform liniment, and have never had any irritation or abscesses resulting.

So far as has come to my notice, but two *American* physicians have written anything respecting hypodermic sublimate injections—Dr. R. W. Taylor, Surgeon of the New York Dispensary (Med. Gazette, May 13, 1871, and cases), and Dr. F. R. Sturgis, of New York City (Journal of Syphilog. and Dermat., April, 1871.) The latter paper was only a review of the merits and demerits of the method, based upon the cases of others.

I requested Dr. Sturgis to give me his views, and he replied in a letter: "I do not doubt the ability to dissipate the symptoms by

this treatment, but what advantages does it present over other methods, to wit, the inunction cure? Now, so far as I am able to judge, it has the disadvantage of pain, abscesses, and a more rapid induction of the toxical effects of corrosive sublimate."

The toxical effects can be avoided by a careful and judicious use of injections, if a suspension in the treatment takes place for two or more days when the same begin to manifest themselves.

The abscesses, Prof. Lewin thinks, are a result of an undextrous insertion of the fluid, he never having it occur in his private practice of 800 or 900 patients. Sometimes an abscess would form upon a hospital patient, only when a new assistant surgeon came to the hospital. But so soon as they acquired a little dexterity, such was never the case. Dr. Taylor, mentioned above, thinks abscesses may be wholly avoided, he having had only two patients suffering from them. Of course, there must be a trifling pain occasioned by the puncture, but it seems to me that any individual would, by far, rather endure this than to have the discomfort of a greasy, unclean apparel which exists with the inunction cure.

According to Bumstead's direction, the ointment should be smeared on at night, and that which remains on the skin must not be washed off in the morning, the same underwear being worn night and day. After the lapse of a week or ten days a bath may be taken, the linen changed, and the same repeated. Besides, those who have employed the subcutaneous method the most extensively, show, by a careful record of cases, that it is more rapid in its cure and more thorough, there being *thirty-five per cent. less of relapses* following it than any other antisyphilitic cure, whether mercurial or vegetable.

And then, again, the relapses which do follow, have a greater percentage of the lighter forms. The pain and discomfort felt from the pressure and distension occasioned by the presence of the liquid beneath the integuments, may be lessened and blunted by gently rubbing the parts, and thus causing the fluid to spread over a larger subcutaneous area.

And further, a suitable quantity of morphine added to the solution will obtund the local hyperæsthesia almost wholly. The advantages of the subcutaneous method and the frequent malignancy of syphilis should make every patient willingly undergo

what little discomfort may unavoidably be connected with the method.

Dr. Taylor has treated fifty adult males and females subcutaneously for syphilis. His experience has detected striking merits as to the method, and certain disadvantages, he thinks, also. He is of the opinion, that the really secondary and even the later secondary rashes are quickly dissipated by this treatment and the rapidity with which the syphilitic neurosis disappears, and in syphilis of the nervous and osseous systems he thinks the hypodermic method is not so beneficial. In opposition to this opinion, we have the more extensive experience of Prof. Lewin, with his 2,000 cases; Prof. von Siegmund, of Vienna, (who has just completed his observations on 200 cases by a course of subcutaneous medication); Prof. Bamberger, of Vienna; Derblich, Bergson, etc.

Prof. Lewin in his work reports most excellent success in cerebral syphilis, even where paralysis has occurred; in necrosis of the bones from syphilis, where rupia and knotty syphiloids existed; in visceral syphilis; and, in fact, in every phase of the disease in its most advanced forms. The injections of sublimate vanquish the rheumatoid pains and the dolores osteocopei with remarkable quickness.

Prof. von Siegmund (Berl. Klin. Wochenschrift, N. 49, 1871), in commenting on his 200 cases recently treated with subcutaneous injections of sublimate, says, that there occurred but two abscesses in all, which resulted mainly from unskillful insertion of the liquid. He has seen no affection of the gums, no disturbances of the respiration or circulation, nor any other mercurial effects of any moment. He is so well pleased with this method of medication, that he states it to be his opinion, that all cases of syphilis will soon be treated subcutaneously with the injections of the corrosive sublimate.

I treated last year, in the German army, over 150 cases of syphilis by this method with perfect success, and also, conjointly with Dr. Gale, of Aurora, over 40 cases in private praxis, with complete success.

Probably when American practitioners have had as large an experience with the method as the above named high authorities, (Lewin and Siegmund), they will coincide with the latter gentleman as to its efficiency and practicability.

ARTICLE II. — *Disease Germs.* By I. N. DANFORTH, M.D., Chicago.

FIRST PAPER.

Whatever the ultimate fate of the so-called "germ theory" of disease may be, certain it is that it has, within the past five years, chiefly through the labors of Lister, Tyndall and Beale, deeply stamped itself upon the thought, and largely influenced the practice, of the profession. Although the germ theory has of late assumed a more tangible and less speculative form, and has in consequence considerably modified former modes of practice, it is not by any means a theory of our day exclusively. Kircher, many years ago, advanced the opinion, "that epidemic diseases are due to germs which float in the atmosphere, enter the body, and produce disturbance by the development within the body of parasitic life;" and this idea found favor with the eminent naturalist Linnæus. While the germ theory was still struggling for a place in the minds of physicians and surgeons, and was by the great majority of them scouted as a fantastic dream, Sir Henry Holland expressed his belief that "some form of this theory was probably true."

For my own part, it requires no stretch of my imagination to believe that very minute particles of living matter (germs) may float in the atmosphere, may find entrance into the system, may therein proceed to multiply, and thus become fruitful sources of disease. Probably, however, the majority of physicians are not yet ready to assent to the germ theory, in all its length and breadth. The idea of such multitudes of parasitic tenants seems, at first sight, revolting and unendurable; yet it is no more revolting than the vague and unsatisfactory fermentation theory, which occasions changes in the blood, says Liebig, "just such as occur in beer making."* It is, however, a matter of considerable moment what one's belief is, since his practice must inevitably be modified thereby, and, chiefly for that reason, I wish to direct the attention of the readers of the JOURNAL to some considerations which seem to me to point towards the truthfulness of the germ theory.

I. The ingenious and beautiful experiments of Prof. Tyndall seem to demonstrate that the millions of dust particles, which we

* Simon's General Pathology, page 203.

all know so constantly float in the air we breathe, are not merely particles of finely powdered inorganic matter, but that they consist largely of organic atoms. Prof. Tyndall found that when the air was made to pass through a cold platinum tube, containing a roll of platinum gauze, it came forth "full of particles;" but when the tube and the gauze within it were heated to redness, the air issued from it "optically empty," that is, the floating matter "totally disappeared."* Hence these particles must be of organic origin, since inorganic matter is not so completely combustible. Having thus established the organic nature of these atoms, the question next arises, *what* are they? Are they living germs, capable of self-propagation, or merely floating particles of dead matter? The answer is, that they are partly living and partly dead; when living, they are capable of practically limitless self-multiplication whenever they chance to alight upon favorable soil; when dead, they are probably inert, or, at the worst, merely irritants which bathing, or an increased flow of mucus, with its accompanying cough or sneeze, will at once dislodge. Prof. Tyndall finds this dust to consist of "particles of ground straw, torn rags, smoke, the pollen of flowers, the spores of fungi and the germs of other things:"† The experiments of Tyndall were made in London, where we should, of course, expect to find the atmosphere thickly laden with impurities.

On the other hand, Dr. Maddox has made many microscopic examinations of particles collected by means of his ingenious apparatus (figured in Beale's "Disease Germs,") from the atmosphere of Woolstone, near Southampton, which, he concludes, "cannot be considered as *loaded* with microscopic germs; the largest number visible and counted as such on one cover being twenty-one, (not including bacteroid bodies.")‡ But if twenty-one germs, exclusive of the possibly equally potent bacteroids, lodged upon a single glass cover, measuring, probably, three-quarters of an inch in diameter; and if each one of these were capable of the marvellous growth which usually distinguishes the germs of microscopic beings, then we must conclude the purest air is always thickly

* Nature, vol. I, page 340.

† Braithwaite's Retrospect, part lxiv, page 29.

‡ Beale's "Disease Germs; their Real Nature," page 79.

populated with these minute particles, whatever the fact may be concerning their power for evil.

II. In the next place it is an additional argument in favor of the germ theory, that recent modes of practice which have been adopted with the view of destroying or excluding germs, have proved more satisfactory in their results, than the most approved methods based upon other ideas. In regard to this, Prof. Lister speaks without doubt or hesitancy. In 1867, in an address delivered before the "British Medical Association," on the "Antiseptic Principle in the Practice of Surgery," he strongly advocates the constant use of carbolic acid in the treatment of wounds, ulcers, and all granulating surfaces, as well as in the dressing of compound fractures. It appears, he says, "to exercise a peculiarly destructive influence upon low forms of life, and hence is the most powerful antiseptic with which we are at present acquainted." In the treatment of compound fractures, Prof. Lister attaches great importance to the exclusion or destruction of "septic germs," which constantly produce decomposition of the purulent discharge. In the management of abscesses and sinuses, continues he, "all that is necessary is to guard against the introduction of *living atmospheric germs* from without, at the same time that free opportunity is afforded for the escape of discharge from within."* As regards the practical results of this mode of treatment, Mr. Lister says, "during the last nine months not a single case of pyæmia, hospital gangrene or erysipelas has occurred;" although previously he "felt ashamed when recording the results of his practice, to have so often to allude to these diseases."† One very interesting exceptional case is recorded by Mr. Lister; an abscess, located near the colon was opened, and in spite of the protection of the incision by carbolic acid dressings, the pus became extremely offensive, and the microscope detected the presence of myriads of vibrios. Death ensued, and the post mortem examination revealed the fact that the abscess communicated with the colon, from whence, therefore, the germs must have been derived. In a still later essay upon this subject, Lister expresses his unshaken belief that "putrefaction under atmospheric influence, as it occurs in surgical practice, is due to

* Ranking's Abstract, vol. xlvi, fol. 148.

† Op. cit., page 149.

particles of dust ever present in the atmosphere that surrounds our patients, and endowed with wonderful chemical energy and power of self-propagation, yet happily readily deprived of energy by various agents, which may be employed for the purpose without inflicting serious injury upon the human tissues."*

The wonderful experiments, of Prof. von Recklinghausen, of Wurzburg, upon blood, have a direct bearing upon this question of the agency of floating particles in producing putrefaction. Mr. Geo. Henry Lewis, writing to Prof. Tyndall, says: "Last spring, when I was at his (Recklinghausen's) laboratory in Wurzburg, I examined, with him, blood that had been three weeks, a month, and five weeks, out of the body, preserved in little porcelain cups under glass shades. This blood was living and growing. Not only were the ameba-like movements of the white corpuscles present, but there were abundant evidences of the growth and development of the corpuscles. I also saw a frog's heart still pulsating, which had been removed from the body (I forget how many days, but certainly more than a week.) There were other examples of the same persistence of vitality or absence of putrefaction. Von Recklinghausen did not attribute this to the absence of germs—germs were not mentioned by him; but when I asked him how he represented the thing to himself, he said the whole mystery of his operation consisted in keeping the blood *free from dirt*."†

It is noticeable that Von Recklinghausen substitutes the term "dirt" for "germs;" the practical difference, however, is simply *nothing;* since, if his specimens were exposed to the air, they would shortly be peopled with forms of low life derived from germs. The interesting results of Prof. von Recklinghausen's experiments —whatever his theory concerning dirt or germs may be—aid us considerably in understanding the satisfactory consequences of the mode of treatment which Prof. Lister so ardently praises.

This subject will be continued in a future paper.

* Braithwaite, for January, 1872.

† Braithwaite, for January, 1872, p. 29.

ARTICLE III.—*A Few Practical Hints on Sponge Tents and their Uses.* By PHILIP ADOLPHUS, M.D., Chicago.

(SECOND PAPER.)

Having in a previous paper spoken of the sponge tent in connection with diagnosis, the writer will pass in review the different diseases, in the treatment of which the sponge tent is useful.

The curative influence of the sponge tent manifests itself in all diseases in which it is employed, by dilatation, pressure and absorption. Pressure produces dilatation, and is an efficient means of stimulating absorption; thus removing deposit. Absorption excites the absorbent vessels to increased action, and therefore causes a more or less gradual, painless loss of texture before slowly increasing pressure. The sponge tent thus is the agent to remove the redundant morbid material. It is a curative agent, when it does this whilst exciting the arterial and capillary vessels little, if at all; but when it is intense enough in its action to arouse the nerves to irritation, or the bloodvessels to an assumption of inflammation, it produces cellulitis, peritonitis, hæmatocele, or intense pain in the pelvic organs; irritation in distant parts, either by sympathy of function or by continuity of nervous and other tissues. The many accidents mentioned by authors, after the use of the sponge tent, are thus apparently accounted for. But what experienced practitioner in the treatment of uterine complaints does not know, that symptoms of local and constitutional irritation are more or less constantly present, or supervene, in all grave uterine complaints, from the slightest causes, and often from no appreciable cause? Have we not perversion of function pervading the whole system? The impaired strength, the anxious countenance, restlessness, disturbed and unrefreshing sleep; the cold and pale surface, disinclination for food, clammy skin, confined bowels, and scanty urine: or again, the profuse perspiration, diarrhœa, the copious diureses and the vast array of neuralgic manifestations. How often are we called to a patient, suffering acute pain of the abdomen, simulating peritonitis or hæmatocele; yet the most searching local manipulation cannot detect these diseases. A dose of morphia, a few leeches, a mustard plaster, a hot poultice, or a local application of chloroform, will dispel the attack, the patient will be

found relieved at our next visit, and this same state of affairs will repeat itself periodically and intermittingly.

Nevertheless, despite these apparently causeless attacks, it behooves us to be careful in the use of the sponge tent, and, besides using the precautions so minutely set forth in the preceding paper, "on the sponge tent as regards diagnosis," it is essential, that no indiscreet haste be indulged in the treatment of uterine diseases, with this agent. The treatment is one of months, not days; gradual, interrupted. The pressure requires to be neither great nor constant; and only by an ever-present remembrance of these principles will treatment be conducted so prudently and patiently as to avoid these ill results to which inordinate pressure by the sponge tent is liable.

It is advisable to precede the remedial use of the sponge tent by local bloodletting or scarification; especially in ailments in which the ovaries are implicated—and they are always involved in grave affections of the uterus. These local depletions should be undertaken a few days before the expected menstrual period.

The tent should not be large enough to produce irritation when placed in situ; it should not impinge on the fundus uteri. It is to be inserted with the same precautions as advised in a previous paper; the time of insertion should be about ten days from the completion of the last flow. A suppository of cotton wool saturated with glycerine is placed immediately over the os uteri, in order to receive the discharge and absorb and neutralize its offensiveness. Let it be borne in mind, that whilst it is not expedient to leave the tent longer than twenty-four hours in the uterus, when its neck is expanded as a means of diagnosis, the tent used as a remedial agent is left in the uterus as long as the patient is not inconvenienced by it. Examine the abdomen daily by pressure; ask the patient whether any pain or irritation is experienced; retract the perineum with two fingers of the left hand, remove the suppository, insert the speculum, press the forceps armed with moist cotton wool against the sponge tent emerging from the os uteri; thereby removing the discharge, and replace the removed suppository by another saturated with glycerine; repeat this daily until the tent is finally removed.

It is not generally expedient to leave the tent longer in situ than 72 hours; for then, despite the presence of the glycerine supposi-

tory, the patient will be annoyed with the fetor of the tent. On its removal cleanse the uterus with tepid water by means of a double current catheter, and insert a pledget of cotton wool, saturated with equal parts of compound tincture of iodine and fluid extract of aconite, into the uterus by means of Emmet's applicator. This is left in situ, a suppository charged with glycerine is laid over the os, and the patient is enjoined to remain as quiet as possible.

Therefore the rule holds good to remove the tent whenever it causes irritation; to leave it, when it does not do so, until the fetor it causes becomes annoying to the patient.

Constitutional and hygienic treatment, together with hot vaginal irrigation, as recommended by Emmet, is essential to the successful result of the cure.

In all cases of chronic enlargement of the womb, so-called general hypertrophy, subinvolution, etc., complicated or not with versions or prolapse, the sponge tent, in certain stages of the disease, used at stated periods, is an efficient aid in its treatment.

We find these cases in persons whose pregnancies have succeeded each other rapidly, and who have been subject to abortions. All the tissues of the womb may be found enlarged or only the cervical or vaginal portion; its connective tissue has increased greatly, not necessarily caused by inflammation, though this may be its result. We have congestion, to which is added that periodical active hyperæmia caused by the menstrual molumen.

Engorgement of the blood vessels of the mucous membrane is present, accompanied by abnormal secretion; we have swelling, succulence of the tissues, and copious generation of young cells (Niemeyer). If this congestion does not relieve itself by hæmorrhage, more persistent and active excitement ensues, and the discharge becomes muco-purulent, then purulent, chronic inflammation of the tissues is added (chronic catarrh) to the already existing proliferation of the connective tissue.

On bi-manual palpation the uterus is found enlarged, painful on pressure; the finger introduced into the rectum ascertains the uterus pressing on this organ, heavy, perhaps retroflexed or prolapsed. The ovaries are nearly always painful, and the usual nervous phenomena generally present, to which may be added those of pressure; menstruation is painful.

Now leechings around the margin of the anus, on the perineum,

around the os uteri; internal scarifications of the uterus and its cervix; external scarifications of its vaginal portion are indicated, and will be followed by beneficial results.

Therefore in the cases above described, local depletion should always precede the sponge tent or any other local application. The first three or four leechings may be practiced at any time, to relieve pressing symptoms; afterwards, they should be timed a few days previously to the menstrual flow.

Emmet, who has been for years using tents in just such cases, does not precede their use by local depletion; his vast experience surely would entitle imitation; yet the writer must candidly acknowledge that in his hands, previously to his using local depletory measures, cellulitis had occurred in several cases.

This is referred to here, not for the purpose of calling the expediency of Emmet's treatment in question, for its success in his hands is the best argument for its continuance; but rather to illustrate that a specific treatment in the hands of one man, by reason of greater experience and nicer discrimination, may be safe and efficient, which, repeated by others, proves a source of injury to their patients. The sponge tent in these cases, by the alterative influence of pressure on the uterine surfaces, produces absorption, softening and depletion, not merely of the neck of the uterus but of its body.

When, in consequence of hyperæmia, the uterus becomes enlarged by diffuse proliferation of its connective tissue, hypersecretion of the glands is induced; so-called nabothian vesicles are developed, the glands degenerate and become cysts; polypi thus originate, and, on account of their vascularity, often cause great hæmorrhage. These morbid growths when pediculated are, of course removed by the forceps or scissors, after proper dilatation; but we find others, non-pediculated, imbedded in the mucous membrane, sessile. The insertion of a sponge tent, in the manner described in a previous paper, will effect their absorption, together with the restoration of the diseased mucous membrane, which caused their appearance.

The sponge tent is also beneficial in the diseased condition called by authors, endocervicitis and cervical endometritis. Our distinguished townsman, Dr. Byford, guided by the same indications, uses slippery elm bougies with great success in these cases. They

are made of the same shape and length as the sponge tent, by means of a pocket-knife and sand-paper; introduced by the dressing forceps, moistened, and bent to the requisite shape of the uterine canal. They are permitted to remain for twelve hours unless sooner removed by pain, and are applied once every twelve days. The patient removes the tent by means of an attached string, which emerges from the vulva.

Dr. Thomas employs medicated sponge tents in this disease with decided success, and speaks highly of their use. The sponge is soaked in solutions of carbolic acid, lead, zinc, copper and iron; is then dried and prepared in the usual manner. They are antiseptic, and communicate to the mucous membrane the alterative qualities of the ingredients.

The writer applies pledgets of cotton wool soaked in various solutions, which he inserts by means of Emmet's applicator in the os and body of the uterus, and leaves them in situ. They will be found in the vagina in the course of twelve hours. The alterative influence of gentle pressure, together with the effect of the medication exercised by the drug in which the lint is steeped, are the remedial influences which he intends to apply to the diseased mucous membrane in this class of cases.

Cases where the mucous membrane of the neck and body is succulent, uneven and papillary, and the elevated and circumscribed granulations are red and granular, giving rise to great hæmorrhage, and which Recamier treated by scraping them with the curette, and to which Sims applied chromic acid, are well adapted to the treatment of the sponge tent; which, by pressure and distention, effects a cure. This is an old and well approved mode of treatment introduced by Simpson.

When are sponge tents indicated in dysmenorrhœa? Dysmenorrhœa is merely a symptom which presents itself in a great variety of cases. Symptoms of pressure, distention or retention may exist; these being relieved, the case is not cured, but a search for the cause is required. It is not sufficient merely to relieve pain, the gynæcologist ascertains the cause of the symptoms, and consequently treats the case understandingly.

All cases of dysmenorrhœa should at first be treated empirically; that is, urgent indications should be met by an appropriate treatment during the menstrual nisus. Should we succeed in witness-

ing a painless natural flow, our duty has been performed. If otherwise, a thorough examination is essential. The following classes of cases require no examination:

Where, according to Scanzoni, the unequal distribution of blood which characterizes anæmia, is the cause of dysmenorrhœa;

Where the amount of flow being too great, it accumulates within the uterus, distending it, thereby causing delay and exciting it to pain;

Cases, occurring in virgins, which are characterized by phenomena of congestion and nervous irritation of the uterus and ovaries.

The principal indication in the mechanical treatment of all diseases which are complicated with dysmenorrhœa, is to induce the proper patency of the uterine canal. With few exceptions, the treatment should be conducted during the interval, when the monthly hyperæmia of the pelvic organs is in abeyance.

In all cases, inflammatory conditions must be first subdued. If fibroids and polypi are obstructive by their position, they should be removed.

Spasm of the cervical canal is oftener met than is supposed; for it is partly muscular, and the cervix and os internum have muscular fibres entering into their structure; therefore spasm is often produced on the introduction of instruments. Here, after local depletion, the bougie of Tilt, the slippery elm tent of Byford, and the small sponge or laminaria tent, answer an admirable purpose and effect a cure.

The tent and other dilating agents hold, however, a subordinate part in the mechanical treatment of dysmenorrhœa. For strictures induced by malpositions of the uterus, and hypertrophied and otherwise diseased cervix, are best treated by incisions.

Dilating measures complete the restoration of the patency of the canal, and may from time to time be used. It is always proper to introduce a tent for a few hours previously to the succeeding menstrual flow in cases where incisions have been previously employed.

The employment of a series of sponge tents is indicated in cases of amenorrhœa, caused by infantile or rudimentary uterus. Their employment is followed by the happiest results. A series of graduated tents should be used, commencing with the smallest.

General treatment is at the same time employed. These local measures, together with monthly leechings, are instituted, not for the purpose of producing absorption or curing congestion, but rather to invite and develop local stimulation and distension.

Finally; when, in cases of abortion, hæmorrhage is great and the loss of the embryo inevitable, the introduction of a sponge tent into the cervix is more effectual than the vaginal tampon. It induces uterine contractions, dilates the cervix, and restrains hæmorrhage. Should the embryo have escaped, the secundines be retained, and hæmorrhage be profuse, the introduction of a sponge tent into the cervix again restrains hæmorrhage, prepares the way for the introduction of the placental forceps or finger, and avoids the use of the annoying and filthy rag tampon, in the removal of which the patient experiences so much pain, and the practitioner, by reason of the insupportable fetor, so much annoyance. The suppository of cotton charged with glycerine, inserted at the same time into the vagina, will, by its cleansing, purifying and lubricating qualities, obviate fetor, pain and uncleanliness. No one who has once tried the sponge tent and glycerine plug, in cases of abortions, will again deny himself the valuable assistance it confers. To Simpson we are indebted for the first suggestion, whilst Sims has the merit of having introduced glycerine in uterine surgery.

318 West Madison Street.

Editors' Book Table.

[NOTE. — All works reviewed in the columns of the CHICAGO MEDICAL JOURNAL may be found in the extensive stock of W. B. KEEN, COOKE & CO., whose catalogue of Medical Books will be sent to any address upon request.]

BOOKS RECEIVED.

Animal and Vegetable Parasites of the Human Skin and Hair. By B. JOY JEFFRIES, A.M., M.D., etc., etc. Boston: Alexander Moore. 1872. $1.00.

A concise, clear and practical exposition of the subject. Several wood cuts are given, which facilitate understanding of the text.

Plain Talk about Insanity: Its Causes, Forms and Symptoms, and the Treatment of Mental Diseases; with Remarks on Hospitals and Asylums, and the medico-legal aspect of Insanity. By T. W. FISHER, M.D., late of the Boston Hospital for the Insane. Boston: Alexander Moore. 1872. $1.50.

A book which concentrates, in small bulk, a vast amount of valuable and suggestive thought. We have not read for a long time a book or essay on the subject which we could as confidently recommend to our readers. It is clear in statement, philosophical in its development, and thoroughly *common sense* in its teachings. To buy it is to put your money to excellent use.

PAMPHLETS.

Small-Pox: The Predisposing Conditions and their Prevention. By Dr. CARL BOTH. Boston: Alexander Moore. 1872. 25 cents.

This *brochure* has attracted much attention both from the professional and secular press. The author concludes that vaccination is not an unfailing protective measure, and that something more sure and certain in its effects is demanded. Studying the relation of the blood-salts, especially table salt, to the albumen, he finds that they perform the office of keeping it in proper balance. If salt is wanting, albumen will be in excess; if it preponderates, albumen is deficient or in demand. The inconveniences attending these extremes are sufficiently obvious. The *predisposition* to small-pox, for instance, "consists in an undue proportion of albuminous matter to the blood-salts, and that as the result, an otherwise inoffensive nervous irritation becomes sufficient to cause the blood to part with this superfluous albumen, which in this case is thrown into the skin, and constitutes that condition which is commonly called small-pox."

He further maintains "that a person who does not exhibit this superabundance of albuminous matter in the blood is *not* liable to small-pox under any circumstances of exposure or contact with patients suffering from this disorder." Hence, he argues, small-pox always occurs when salt is scarce or absent. It is more likely to occur to spirit drinkers, because alcohol throws out their blood-salts, producing a preponderance of albumen. The Prussian army

had no small pox in the late war because they were well provided with *pea sausages*, which contained not only salt but *all* the necessary ingredients the human body requires for health and vigor.

Not only alcohol but sugar is vicious in this connection, because it satisfies the taste which otherwise would demand salt. But as sugar cannot replace salt in its uses in the blood, when persons employ it to the exclusion of salt they are thereby rendered more liable to infection from small-pox.

Unfortunately, it will not do for those who have erred in these respects to rush, incontinently, into the excessive use of salt, for according to Dr. Both, who italicizes the proposition, this may be the immediate occasion of the appearance of the dreaded disease. It is better in these cases to first give organic acids, lemon juice, etc., and then gradually introduce the saline.

In American cities, 75 out of 100 children are fed too little salt. It should be used in puddings before sugar. Incidentally, he claims that tea, coffee, alcoholic stimulants, and even milk, should not be taken with the meals. The close is as follows:

"*Resume.*—Let it be distinctly understood that what I intend to say is, that vaccination has not proved to be an absolutely reliable preventive against small-pox; and, therefore, that better means for protection are needed.

"That it is absolutely necessary, first, to know the nature of a disease before any attempt can be made to prevent it.

"That I have discovered the following facts, and maintain, that small-pox consists in the escape of *superfluous* albuminous substances into the tissues of the periphery of the nervous centres of the body, caused, in the first place, by the want of salt.

"That the *proper* use of salt is the scientific and most certain preventive of small-pox, both in theory and practice, that I have any knowledge of.

"That the use of organic acids is the best means of freeing the blood from abnormal substances, which, for the time being, may substitute the place of salt in the body.

"That alcohol is an agent which eliminates the blood-salts, and, therefore, after its use, the salt thus eliminated must be restored.

"That sugar can take the place of salt in regard to taste, much to the injury of the blood of the person substituting it.

"That in mental labor more salt is brought into requisition, and used up, than in muscular or physical labor; and, therefore, that

more must be used or taken into the body in the former case than in the latter.

"That a person who has a properly balanced blood cannot catch, or take, small-pox under any circumstances of exposure.

"This theory, if correct, must hold good in all cases, without a single exception; and if nothing can be found to disprove its correctness, it holds good that the *proper* use of salt in the human economy, will eradicate small-pox at once and forever.

"Therefore the use and office of salt should be more generally known and taught in all our public schools."

Editorial.

Order.

To avoid delay in the present No., Original Communications have been placed after Selections. Correspondents are respectfully urged to hand in their favors on or before the 10th of the month.

Bogus Diplomas.

It is evidence of a gratifying improvement in the public *morale*, that the legislature of Pennsylvania, on proof that certain so-called medical colleges had been engaged in the disreputable and infamous practice of selling diplomas, promptly repealed their charters.

Selling Practice.

On another page will be found a legal decision which is of interest to physicians selling out their business, with a proviso that they will not continue in practice in the same locality. Such contracts are decided void, as being contrary to public policy—the community being entitled to every man's industry and skill.

In the case decided, the testimony shows that the venereal specialty ranks next, in its profitable results, to the womb business. As we are thoroughly "regular" ourselves, we will not undertake to say which branch of the two is the most respectable.

Important to Sellers of Practice.

An entirely new question in its scope in this State was on Saturday decided by Chief Justice Williams, of the Circuit Court. The question is, When does a contract in restraint of trade become void? The question arose on the chancery proceeding of Charles C. Jerome against Charles Bigelow. The opinion was as follows:

Complainant and defendant both profess to be physicians in the city of Chicago. Prior to May, 1870, the defendant had been practicing as a physician, and more particularly as a "specialist," and had secured in this and other States a considerable professional business. On the 10th of May, 1870, complainant and defendant entered into an agreement, by which the defendant stipulated, upon the consideration of $40,000, to be paid by complainant, in semi-annual payments of $2,000 each for ten years, to license and permit the complainant to enter in and take possession of his office in Chicago, and the goods and chattels therein, and to carry on the business in the special department in which defendant was then engaged, in the name and under the patronage of the defendant, from the 5th day of July, 1870, for the period of ten years thereafter, and that until the expiration of said ten years defendant would not, in his own name or otherwise, prosecute his profession in its general branches, nor in the specialty in which he had been engaged in the city of Chicago, nor within a radius of 500 miles thereof.

By a supplemental agreement, Bigelow is to take one-half of the net profits of the business instead of the payments agreed to be made by the original contract.

The defendant, after the fire, having resumed the practice of said specialty in the city of Chicago, the complainant, on the 18th of October last, filed his bill in this court, setting up the contract above referred to, alleging that he had performed his part of it, and had paid defendant under it several thousands of dollars, and praying that defendant might be restrained from engaging in and practicing the profession of medicine in the State of Illinois, or anywhere in the Northwest, for the remainder of the unexpired term of ten years.

The most important question raised upon the argument of this case is as to the validity of the contract so entered into on the 10th day of May, 1870, the defendant insisting that the contract is void, for the reason that it is in restraint of trade, and therefore against public policy.

The decisions upon this question run through a period of more than 450 years. The first reported case was A. D. 1415, in the reign of Henry V., when English jurisprudence was in its infancy, and when judicial manners were so rude that an English Judge accompanied the delivery of his opinionwith threats and blasphemy. The rule of law, as then stated, and long thereafter maintained, has been modified by the advancing civilization of the ages and the manners of the forum still more.

The law as it now exists may be thus stated: That the legal presumption is against every contract in restraint of trade, whether that restraint be general or partial; that every contract for a general restraint of trade is absolutely void; that while the presumption is against a contract in partial restraint of trade, such presumption is capable of being rebutted, and such contracts are often held valid, provided they are reasonable, and upon adequate consideration.

[The Court here cited the more important American decisions sustaining his statement of the law.]

Thus far there is no difficulty in determining what is the law, for not only is it so declared by the American Courts, but the uniform current of English decisions for more than 150 years, since the leading case of Mitchell *v.* Reynolds, (1 Peere Coms. 181), is in the same direction. But what shall be regarded as a

general and what a partial restraint of trade, and what partial restraints shall be held valid and what void, are questions not so easily determined.

The vital question in reference to partial restraints of trade is, whether they are reasonable or unreasonable. If, in the opinion of the Court, the restraint has been greater than the protection of the party who seeks the benefit of the restriction requires, such restriction has been held unreasonable, and the contract void. Under the law as thus declared, each case of partial restraint must be decided with reference to its own particular circumstances, and the reasonableness or unreasonableness of the restriction being a question for the Court, it is not strange that different decisions have been made in cases where the facts were substantially the same. The principle controlling the case is well settled; the only difficulty is in its application.

Almost all the cases which I have had the opportunity of examining, whether English or American, are those in which the restriction has been confined to less territory than the kingdom or the State. Is a restriction co-extensive with the kingdom, in Great Britain, one which, by their Courts, would be regarded as general or total? In the case of Homer *v.* Ashford (3 Bingham, 326), Chief Justice Best, in delivering the opinion of the Court, said: "Any deed by which a person binds himself not to employ his talents, his industry, or his capital, in any useful undertaking in the Kingdom, would be void." Similar expressions are used in other English cases, but in none of them, except in the case in 3 Beavan, was the precise point before the Court; for, in none of them to which my attention has been called, with the above exception, was the restriction co-extensive with the territory of England.

In the case last referred to, Lord Langdale, Master of the Rolls, held that an agreement on the part of certain attorneys not to practice in Great Britain for the period of twenty years, without the consent of the attorney to whom they had sold their business, was not an unreasonable restriction, and that the contract was valid. This case, perhaps, goes further than any English case, and the correctness of it has been questioned by a learned English annotator. The English decisions appear to have assumed that a restraint, co-extensive with the kingdom of Great Britain, would have been void, and many of the expressions of the judges in their opinions, are to this effect, but generally they are mere dicta.

What shall be a general or total restriction of trade in America? Whether it shall be a restriction co-extensive with the particular State in which the contract is made, or with the boundaries of the United States, has not often been raised in our courts.

[The Court cited several authorities, to the effect that a total restraint of trade, as that a man will not pursue his occupation or carry on business anywhere in a State, is void.]

I have found no American case which holds that a contract in restraint of trade, which is co-extensive with State jurisdiction, is valid, while there are two decisions and many dicta which sustain the opposite view. The only English case which holds that a restriction extending throughout Great Britain is valid, is the one in 3 Beavan, referred to.

It is because the law protects all branches of trade and business from monopoly that it has held general contracts in restraint of trade void, and each State is better fitted to protect the rights of its citizens in this regard than the General Government. It is a matter pertaining to the municipal laws of each State, and each State in the Union is independent of every other as to these laws. It is for the interest of each State to protect and encourage trade, commerce and business within its own particular jurisdiction. Reason, as well as the weight of authority, is in favor of the view, that for the purpose of determining whether or not a restraint is general, reference is to be had to the boundaries of the State, and not of the United States.

The restriction in the case at bar prevented the defendant from practicing his profession generally or in the specialty in which he had been engaged in Chicago, or within a radius of 500 miles from this city, which by a further pro-

vision of the contract, was to be construed "to include all the Western and Northwestern States and Territories."

The defendant was thus excluded from practice, not only in the State of his residence, but also throughout adjoining States and Territories, containing an aggregate population of several millions, and he was not only restrained from practicing the particular specialty to which the contract immediately refers, but every branch of his profession. Under no decision, English or American, which I have examined, has such a contract been held valid. It is unreasonable, for it was far more of a restriction than was necessary to protect the interests of the complainant.

It is true, that it appears by the pleadings and evidence that under the name of "Charles Bigelow" the defendant was doing a large business as a specialist in Chicago, and also by a correspondence conducted with parties scattered all over the United States, yet it can hardly be contended that, in order to protect the interests of the complainant as a specialist in Chicago, it was necessary that the defendant should refrain from entering into a general practice as a physician in Minnesota, Kansas, and Colorado, and the yet more remote portions of the West and Northwest.

The contract is, therefore, void, because it is an unreasonable restraint. Inasmuch as the contract is void at law, the complainant is not entitled to any relief in equity. The bill will be dismissed.

CHICAGO, ILL., April 5, 1871.

DEAR PROFESSOR—

If a man commits suicide now, he is said to be afflicted with temporary insanity; if he shoots some one else, the law declares him to have been temporarily insane. I would invoke the common sense of the profession through your columns, on this matter.

Nearly all men know occasions during their lives when death would not seem unkind. Some men have never any great love for life; if then the temptation presents itself, reinforced perhaps by a sudden loss or so, to end the grand struggle, the proposition may be submitted to debate, and if the party most concerned can divest himself of that "fear of something after death," what is there remaining to hinder him though he be a rational party, from resorting to the hackneyed or seeking the unique in the way of quieting tissue metamorphosis forever?

If sleeplessness and perturbation result from too close a contemplation of the intended proceedings, the party is said to exhibit all the signs of insanity. Now this condition may be *called* insanity, but the party should be considered responsible for the steps by which he has *reasoned* himself into it.

Very respectfully, INKE MARKS.

Items, News and Gossip.

M. Maisonneuve, of the Hotel Dieu, makes large use of ice-poultices in the treatment of wounds. Lumps of ice the size of large marbles are scattered at intervals of an inch or more over a tolerably thick linseed-meal poultice, the whole is then covered with a little more of the meal and a cloth, and the thick side is applied to the wound. —— The use of extract of conium in the treatment of inflammation of the breast is being revived in Germany. —— Prof. Deneffe, of Ghent, has used for a couple of years, a combination of camphor and bromine which he thinks a most excellent sedative for the nervous system. "Monobromized camphor" differs from ordinary camphor by the substitution of one atom of bromine for one of hydrogen. —— In *pruritus vulvæ*, Mr. McGrath (*Canada Lancet*) states that he has found this lotion, applied by means of a soft sponge after ablution, morning and evening, very satisfactory:

R.	Biborate of Soda,	dr. ij;
	Hydrochlorate of Morphia,	gr. xx;
	Hydrocyanic Acid,	dr. j;
	Glycerine,	oz. j;
	Distilled rose water,	oz. viij.
M.		

—— Dr. Green (*Atlanta Med. and Surg. Jour.*) lauds permanganate of potash as a local application in carbuncle. It is nearly painless, and after a few moments the application produces comfort. After the slough is discharged he dresses the part with carbolic acid lotion, and spreads over all, lint smeared with benzoated zinc ointment. —— Dr. Schmidt (*N. Y. Med. Jour.*) recommends one drop of tincture of iodine every two hours in the incontinence of urine of advanced life. —— Dr. Monteverdi, a Venetian physician, asserts that Peruvian bark and its preparations possess emmenagogue properties superior to ergot. Sulphate of quinia, five grains every hour, will bring on miscarriage and premature birth. In protracted labor with feeble pains, he uses this instead of ergot, and finds it rapidly successful. So also in rigidity of the os and retention of the placenta. —— Dr. Walker (*Med. Archives*) reports a case of incipient bone felon cured by congelation. He placed

the finger in a freezing mixture, equal parts of snow and salt in a tumbler until sensibility ceased, repeating the process as it returned, continuing for two hours. Perfect cure resulted. —— Dr. Bird (*Med. and Surg. Reporter*) uses an ointment of charcoal and lard to prevent pitting in small-pox. —— The *Georgia Med. Companion* recommends a solution of extract belladonna and glycerine (dr. j to oz. j) for local application, instead of the ordinary ointment or plaster. —— Prof. Gross characterizes carbolic acid as a fanciful preparation that has had its day. But the Edinburgh Med. Journal adds another to its long list of uses, in that in gunpowder burns, in addition to its antiseptic and anæsthetic properties, it has the power of suspending the carbon in solution and withdrawing it from the skin, thus preventing discoloration. —— Dr. Caspari has for twenty-five years treated obstinate vomiting successfully with tincture of iodine. —— Dr. Pattee, of Boston, gives in the vomiting of pregnancy, from dr. j to oz. ss. of the acid syrup of the hypophosphite of lime. —— In 1820 there were only 100 dentists in the United States. In 1858 there were 4,000. —— Thirty-one physicians have been made baronets in England since 1645. —— The cost of the clergy to the United States is estimated at $12,000,000 annually; that of the criminals, $40,000,000, and of spirits, $600,000,000. So says the Medical Record. —— *The Clinic* (Cincinnati) is proving itself a success. We congratulate editors and publishers. —— Dr. Both proposes to stamp out small-pox by salt diet, but the chief physician of Iceland claims to have smoked it out with sulphur, with the aid of sulphurous acid and water drank by the patients. The disease at all events disappeared. —— Dr. Toner claims to have established by statistics, that the average American mother has fallen off as a producer. He says only one-half as many children are born now to each thousand women as in 1800, and that each decade shows a regular decrease. —— Over a million and a quarter of dollars worth of opium were imported through the custom house of New York in 1871. —— The *lobelia inflata*, a drug much praised and abused by quacks, and somewhat slighted by the profession, is in constant use among the out-patients of the city hospital, for diseases of the chest. In doses of ten minims, three times a day, it appears frequently to produce the most admirable effects in cases of chronic bronchitis, complicated with a tendency to paroxysmal asthma. It is commonly given in con-

junction with sedatives, expectorants or stomachics, often agreeing remarkably well with the latter. Patients taking it frequently complain of nausea and sense of depression during the half-hour or so following each dose, but it seems on the whole to decidedly improve the appetite and digestion. If the nausea be excessive, combination with a few drops of dilute hydrocyanic acid is often used.—*Cincinnati Lancet.* —— Delay in appearance of the JOURNAL enables us to announce the death upon the same day (April 5th) of Zina Pitcher, M.D., of Detroit, Mich., and Samuel Jackson, M.D., of Philadelphia. Dr. Pitcher was aged about 75 years, was one of the oldest citizens, assisted in founding the free schools of Detroit, and the State University of which he was for many years a regent. He had occupied many prominent secular and professional positions. He was an Emeritus Professor in the Michigan University, a position to which he was nominated by the present writer. He had also been one of the Presidents of the American Med. Association. He was a model of the courtly gentleman of the old school, and his death will be widely lamented. Dr. Jackson was in his 85th year, and had been connected with the University of Pennsylvania for 28 years, the latter portion of the time as an Emeritus Professor. Few professional men in our country were more extensively known or more highly esteemed. —— Dr. Toner, of Washington, the most indefatigable of statisticians, is compiling a Medical Directory and Register of the United States. Any medical gentleman wishing immortality should communicate his name and *status* at once, or forever after hold his peace. Dr. S. W. Butler, of the *Philadelphia Reporter*, will receive names and addresses. The Directory will cost $5.00 till May, and afterwards $6.00.

Loot.

Cerebro-Spinal Meningitis.

The rumor that epidemic cerebro-spinal meningitis has appeared in some portions of this State, and the announcement that some cases have been reported to the Board of Health, induces me to write a few lines, with the hope of calling the attention of medical practitioners, who may have the opportunity of seeing this disease,

to some details of treatment, and especially to the use of the ordeal bean of calabar, which I believe has been of service to me in the management of a recent limited epidemic.

Since the beginning of November last I have treated forty cases of cerebro-spinal meningitis. Twenty-nine were well-marked typical cases. The ages of my patients ranged from 3 to 16 years. Four died, and one is not yet out of danger. As this epidemic occurred under peculiar circumstances, and presented many features which may be of interest to the profession, I propose to publish soon a full report.

The therapeutics of this disease are notoriously unsatisfactory. The mortality of reported epidemics ranges from 30 to 75 per cent. The death-rate of my cases is only 10 per cent. But their number is too small to allow any legitimate conclusion to be drawn from such limited statistics as to the value of any particular treatment. I anticipate my report, therefore, by this preliminary statement, that others may not miss an opportunity of testing the value of the remedies I have employed.

Waiving for the present all discussion concerning the nosology, etiology, pathology and morbid anatomy of cerebro-spinal meningitis, I may be permitted to state that the most salient and central feature of this disease seemed to me to be an enormously increased reflex irritability of the nervous system, with an attendant paralysis of some branches of the sympatheticus. In studying my first case it occurred to me that calabar bean, which ophthalmologists use in eye-diseases dependent upon an irregular or interrupted innervation of the dioptric apparatus, and which lately has acquired considerable reputation in the treatment of various forms of tetanus, might be of use in this disease, the symptomatology of which is so largely made up by paretic and tetanoid phenomena.

At first I used the tincture of calabar bean, but afterwards I succeeded in procuring the extract. The extract was manufactured by Hazard and Caswell, 2½ drachms of which are equal to 2 ounces of the bean. I had one drachm rubbed up in glycerine and gave 2–5 drops at a dose.

I administered this drug in every case, as soon as tetanic contractions or apparent paralysis of the sphincter iridis appeared; except in two fatal cases, one of which terminated very rapidly, the other occurred before I had obtained the extract and after the tincture was exhausted.

In the great majority of cases the drug seemed to exert a favorable influence upon the symptoms which it was intended to control. In a few of the milder cases, where there was rather a contracted pupil, I administered atropia in pretty full doses, without, however, influencing the general course of the disease.

In the onset of the attack the symptoms are generally so violent, cephalalgia and rachialgia so severe and distressing, the skin and mucous membranes so congested, that depletion seems the one

thing indicated, and yet I have resisted every temptation to abstract blood. I have neither bled, nor leeched, nor cupped, nor blistered. Ice in bladders to head and neck mitigated the pain and proved grateful to the patient.

Cathartics I used very moderately, not intending to produce any revulsive effect upon the bowels.

I had no reason to be dissatisfied with this treatment, when afterward, in some of the protracted cases, a prostration set in as extreme as the precedent violence, and a degree of emaciation followed which rivaled the marasmus of the everlasting gastro-intestinal catarrh of starveling foundlings.

In the first days, or whenever, in the course of the disease, there was great restlessness, or violent jactation, I administered moderate doses of chloral hydrate, 10–15 grains, repeated as required. Morphine I gave only in one case where ice seemed unpleasant and headache was worse.

Although there is a certain rhythm and periodicity in the progress of this disease, I have seen no reason for giving quinine until after convalescence was established, and then, in combination with iron, it doubtless proves beneficial in re-establishing the vigor of the system.

In most of the cases periods of coma follow, or alternate with spasms and jactations. In such cases I have found the iodide of potassium of service. But this drug must be administered with a bold and liberal hand. I have given from two scruples to a drachm in 24 hours; generally alternating it with the extract of calabar bean, so that my patients received every two hours either a dose of calabar (2–5 drops) or a dose of pot. iod. gr. 6–10.

Cerebro-spinal meningitis is not a self-limited disease; it is protean in its manifestations; probably more frightful in its phenomena than severe in its anatomical lesions,—at least in a majority of cases,—and offers, therefore, a hopeful field to therapeutists, although few victories have as yet been won. To induce physicians to make new trials I have ventured to state briefly the method of treatment I have pursued; so far as its results go, I believe they are more favorable than any that have been obtained.

In general hygiene little could be done in the present state of our knowledge as to the cause of the disease. I have used carbolic acid as a disinfectant, and internally to some extent.

In concluding these lines I wish to express my gratitude to Professor Jacobi, who had the extreme kindness to visit my patients with me, and to whose profound knowledge of the diseases of childhood and skillful application of modern therapeutics I am indebted for much valuable advice.—C. F. RODENSTEIN, M.D.—*Correspondence Med. Record, N. Y.*

Report on Vaccination.

The daily observations and experience of physicians have, for seventy years, uniformly proved that in their personal exposure to the sick of small-pox, and by the severest testing of the attendants of the sick in hospital, sick-room, and ambulance, thorough vaccination continues to give full protection against the contagion, for they are freely exposed to its presence, and even to its touch, without harm. Thorough vaccination is thorough protection against small-pox, and is as effective now as in the time of Jenner. It is generally admitted, and clearly proved, that thorough vaccination protects against small-pox without danger to life or diffusing any infection. Scarred and disfigured faces are rarely met with at the present day, except in persons who, having neglected to be vaccinated, have taken small-pox in the natural way. In proof of this protective influence of vaccination, and the liability to infection without it, we may mention that in a severe epidemic in Norwich, England, of 306 persons in several families, there were among 91 vaccinated persons, two cases of mild varioloid, and no deaths; and of 215 unvaccinated persons, 200 took the disease, and 46 of them died.

Revaccination is recommended, not only as a measure of renewed security against small-pox, but as a test of the completeness of the first vaccination. It is necessary to test the completeness of protection and to exhaust the receptivity of small-pox, and of vaccination itself. He who is insusceptible to one or more revaccinations with fresh virus, may generally deem himself as secure as vaccination, or even an attack of small-pox itself, can make him.

Small-pox, it is true, occurs occasionally in persons who have been once vaccinated; but its occurrence is very rare in those recently vaccinated, or revaccinated once or oftener, or in those in whom the first vaccination was thoroughly good, as judged by the Jennerian rules for vaccination. In these instances the disease manifests itself oftenest in mitigated form, known as varioloid, and the protection afforded by vaccination is found to be equal to that which is conferred by a previous attack of small-pox. It is believed that a revaccination will destroy any susceptibility to small-pox infection which may remain from incompleteness or imperfection of the primary vaccination. In the army of Bavaria revaccination has been compulsory since 1843, and from that date until 1857—a period of 14 years—not even a single case of unmodified small-pox occurred, nor a single death from the disease. The vaccine virus now in use in New York City is justly regarded by the most experienced physicians as trustworthy and effective, and affords all the necessary protection. Vaccine virus is not a carrier of other diseases. To a neglect of reasonable precautions, and to carelessness in the performance of the first vaccination, are due

the unmerited discredit into which this greatest boon of a merciful Creator has occasionally fallen, and the fatal objection of certain classes to its employment. With due precautions, no other disease than that of vaccinia will be communicated. The distinguished English vaccinators, Dr. Marson, in 40,000 vaccinations; Dr. Leese, in as many more; Sir Wm. Jenner, in 13,000 sick children and adults in London, and Dr. West, of the Children's Hospital, in 26,000 children—all concur in saying that they have never seen any other diseases communicated with the vaccine, and that they disbelieve the popular reports that diseases are so communicated, nor is the child from whom the lymph is taken found to be suffering from the disease it is said to have imparted. Fresh lymph is always to be preferred when it can be obtained; but crusts may be used if such lymph is not to be had, and there is immediate necessity for vaccination. When practicable, it is desirable to vaccinate from arm to arm, with virus taken on quill-slips directly from a healthy individual to the arm of another.

Vaccination, by preventing small-pox, indirectly diminishes scrofulous diseases; and the death-rate of most constitutional diseases, to say nothing of small-pox itself, has materially decreased as the practice of vaccination has increased; and not only has mortality been diminished, but life has been lengthened and population augmented. The exact reverse is true of the former practice of inoculation of small-pox.

There is no age at which a person should or should not be vaccinated, when a necessity exists for immediate protection against small-pox; but it is best done in early childhood, for then the irritation is less, and the child unable to relieve itself by scratching the part, which, with the irritation of the clothes, often interrupts the progress of the vesicle, causes it to discharge prematurely, and become inflamed; whereby a vaccination, which might have run its course naturally, becomes altered, and an inflamed angry sore is produced, leaving a deformed and ill-looking scar and a diminished protection. Matter, too, taken from such a sore is worse than valueless. The age of three months is, on the whole, to be preferred. The most distinguished English authorities in vaccination, Simon, Marson, Seaton, and others, recommend, as preferable, and as ensuring greater ultimate protection, four or five separate good vesicles; and of these, in taking virus for the purpose of vaccinating others, one at least should remain untouched.

The utmost care should be taken, in the performance and management of a first vaccination, to make it as nearly perfect, regular, and exhaustive as possible; for upon this depends very much the after-susceptibility to small-pox, and it is very doubtful whether any amount of subsequent revaccination will fully compensate for the deficiency of the first.

The period for revaccination may be determined by circumstances; it never can be done too early or too promptly in persons

exposed to small-pox, and it should be performed in every person soon after the age of puberty, however frequently it may be repeated at earlier or later periods of life. It may succeed at one time when it would not at another; indeed, it appears to be true that revaccination, as well as primary vaccination, actually takes more readily in some years than in others. "One thoroughly good vaccination to start with," says Seaton, "and one careful revaccination after puberty, are all that is necessary for protection as complete as any known proceeding can give against small-pox." After the twenty-fifth year of age the liability to small-pox in the well vaccinated is very small. Of the nearly 50,000 revaccinations in the Prussian army in the year 1833, only about one-third were perfectly successful; resembling, that is, the results of a primary vaccination so closely as scarcely to be distinguished from it; the remaining two-thirds being more or less modified, or failing entirely. In other trials on a large scale the success has not been as great. It should be remembered that secondary small-pox occurs on an average in about one per cent. of cases; and that while we urge revaccination both as a test of remaining receptivity to it and of further exhaustion of what may remain, it is well known that a single well-performed vaccination, perfect in all respects, with few exceptions, suffices to secure for life an individual subjected to it. The small-pox has lost none of its malignity and virulence, and while unvaccinated persons are allowed to accumulate, it is vain to hope for any exemption from epidemics of greater or less extent. In times of epidemic prevalence of small-pox, all should encourage vaccination. Vaccination and revaccination are positive duties. In order to give complete and assured protection against small-pox, every person not recently and thoroughly vaccinated should be at once revaccinated, and in subsequent life should repeat this duty as often as every five or six years, until in adult life the repeated revaccination ceases to have effect.—Dr. ROBERTS—*Med. Record.*

Hydrate of Chloral as a Rubefacient and Escharotic.

A correspondent of the *Scientific American* strongly recommends the hydrate of chloral as a rubefacient and escharotic. He says: "When applied, the burning is precisely like that produced by a cataplasm of strong mustard; but, at the same time, a sedative action is perceived, which somewhat neutralizes the smarting, while it does not prevent an excessive irritation of the skin. It does not blister, but the part the chloral has been applied to becomes exceedingly inflamed, and more or less swollen, and, according to the length of time of application, shows a merely reddened skin, or a suppuration of several weeks' duration.

"I give you my mode of application: Take a piece of fresh adhesive plaster, of the size wanted, and crush fine, on its surface,

with an ivory spatula, enough of the crystals of the chloral to powder the piece of adhesive plaster quite evenly; use the edge of the spatula to take off the chloral where it is more than a mere dust in thickness, but distribute evenly, leaving one-third of an inch margin for adhesion; heat the back of the plaster for an instant only, and apply. Leave it on about half an hour as a rubefacient, six hours as an irritant. To produce suppuration, put the chloral on the plaster in large quantities, and leave on from twenty-four to thirty-six hours; on its withdrawal, apply a stimulating salve, and afterwards heal with cerate. For an escharotic effect apply the chloral, thickly spread, and, after twelve hours, repeat the application, if necessary.

"It is surprisingly active as a suppurative, and for this reason it will not be prudent to apply it to any part of the surface of the abdominal cuticle, as, in one case under my inspection, having been left on too long, it occasioned a deep ulceration that was difficult to heal."

In this new mode of use, the chloral is truly invaluable, it is easily applied, cleanly, and perfectly reliable.—*Boston Journal of Chemistry.*

A Plan for Facilitating the Reduction of Strangulated Inguinal Hernia by Taxis.

A correspondent of the *British Med. Journal* calls attention to a method recommended by Baron Sentin to be followed in this operation. The patient is to be placed on the back, with the hips well raised, and in case the hernial tumor is not reducible by the ordinary manipulation, the surgeon is to pass his index finger up into the ring, if possible to the outer side of the gut. After crowding the point of the finger past the column of the ring, strong and constant pressure is made, until the fibres of the ligament give way, or the opening is perceptibly enlarged, when it will be found that the intestine can be returned easily to the abdomen by the usual effort. The conditions which contraindicate a resort to this procedure, are:

1. The fact of the hernia being old and irreducible.
2. The presence of the constriction at the inner ring—the external ring being too small, and the canal too long, to admit the finger.
3. The existence of general symptoms of gangrene of the intestine.—*Med. Record.*